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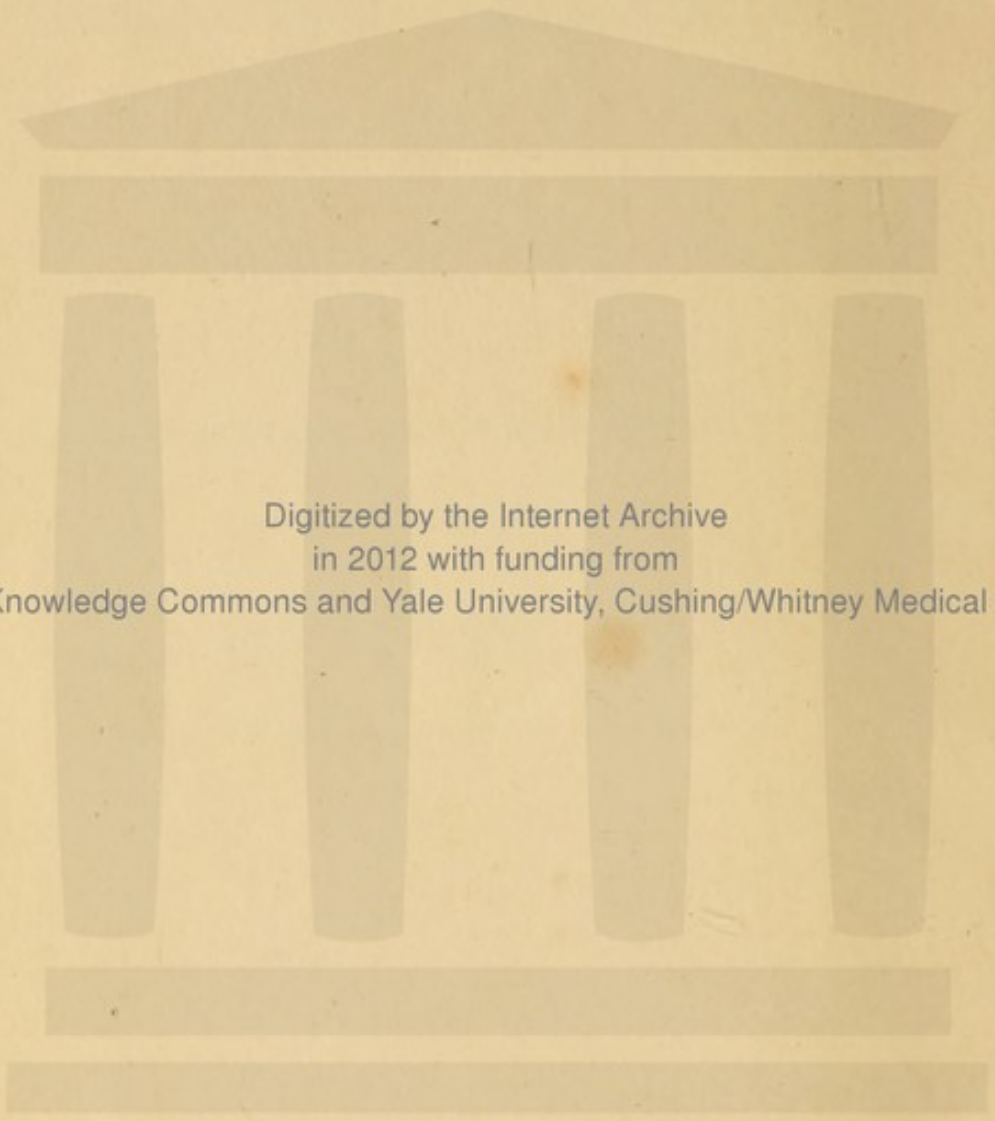

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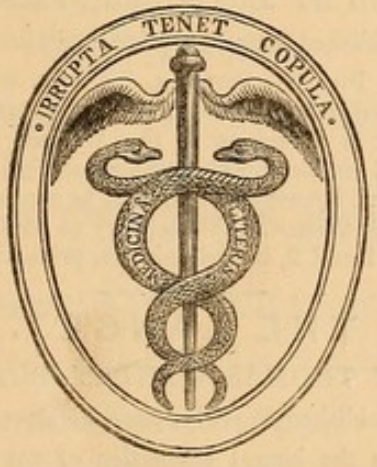

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FACTS AND OBSERVATIONS

IN

MEDICINE AND SURGERY.

FACTS AND OBSERVATIONS

IN

MEDICINE AND SURGERY:

THE GLEANINGS OF TEN YEARS OF ACTIVE GENERAL PRACTICE,
AND HAVING PARTICULAR REFERENCE TO

FRACTURES AND DISLOCATIONS,

GUN-SHOT WOUND, CALCULUS, INSANITY, EPILEPSY, HYDROCEPHALUS,

The Therapeutic Application of Galvanism,

AND FIBRINOUS DIARRHŒA.

BY

JOHN GRANTHAM,

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND; AND
FELLOW OF THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

LONDON:
JOHN CHURCHILL, PRINCES STREET,
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TO

ERASMUS WILSON, ESQ.

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND;
CONSULTING SURGEON TO THE ST. PANCRAS INFIRMARY;
LECTURER ON ANATOMY AND PHYSIOLOGY IN THE MIDDLESEX HOSPITAL;
FELLOW OF THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

My dear Friend,

Allow me thus publicly to return you my thanks for the encouragement which you have given me in the compilation of this little work, and the approbation you have expressed of the principles and practice therein contained; and having now brought it to a conclusion, I beg to dedicate it to you, as a testimony of my high respect for your professional talents and private virtues. With the most sincere wish for your future happiness,

I remain,

Yours very sincerely,

John Grantham.

Crayford, Kent,
October 1, 1844.

PREFACE.

A FACT is the centre of a circle more or less extended, and *to* and *from* which opinions and theories radiate. Thus, some books are written *to* a Fact; others, again, *from* a Fact; and though both may be wrong, the Fact happily remains the same, the indestructible germ and nucleus of the most enlarged and momentous truths.

To communicate Facts, therefore, even in their simplest form, is to contribute a donation to science of the greatest value. Facts bear in themselves the properties of truth, the *matériel* of thought, and are not the less worthy for being unaccompanied by the ostentation of new hypotheses and theories.

In publishing this book of "scattered leaves," which

are the "collectanea" of the last ten years of active practice, printed at intervals in the Medical Gazette, I offer no apology, seeking no merit further than that which is due to the labour of close observation and experiment. The following facts are therefore given to the profession, in the hope that they may become the *matériel* of useful practical induction.

CONTENTS.

PART I. — SURGERY.

PART II. — MEDICINE.

PART I.

SURGERY.

MECHANICAL APPARATUS FOR THE TREATMENT OF FRACTURES.

SPLINTS FOR THE UPPER AND FORE-ARM.*

WHERE the science of mechanics can be brought in aid of that of surgery, it must be very desirable to the humane practitioner, as in many cases, when applied with skill and ability, it will tend to alleviate the sufferings of the patient, and its application will redound to the credit of the surgeon.

For some years past, I have devoted much time and attention to the subject of fractures and dislocations of various bones, and the result has been the sugges-

* This paper was published in the "Medical Gazette," June, 1833.

tion of certain splints and other machinery, which, as far as I know, are new, and which, in my extensive practice in this manufacturing district, have answered the end required to my perfect satisfaction. They have been exhibited in some of the lecture-rooms of the metropolis, and highly approved of by several hospital surgeons of the first character.

In the mechanical part of the treatment for fractures of the humerus, I have adopted the following plan, which combines two principles derived from Dr. Neil Arnott's invention for compressing tumours, viz., a resistible and an irresistible support. This plan affords comfort with security, and is applicable to the treatment of all fractures of the extremities. The means which I term resistible consist of an Indian-rubber cloth bag, made so as to fit the internal part of the splint, half filled with air. The pad should protect the limb from the edges of the splint, to prevent excoriation of the skin, and if this is not attainable, the next best plan is to line the splint with wool or fine charpie. The French surgeons use bags filled with oaten chaff, which form an easy support; but none of the latter plans equal the first for comfort to the patient. The wooden or sheet iron splints, whichever the manufacturer may adopt, form the irresistible support.

Fig. 1.

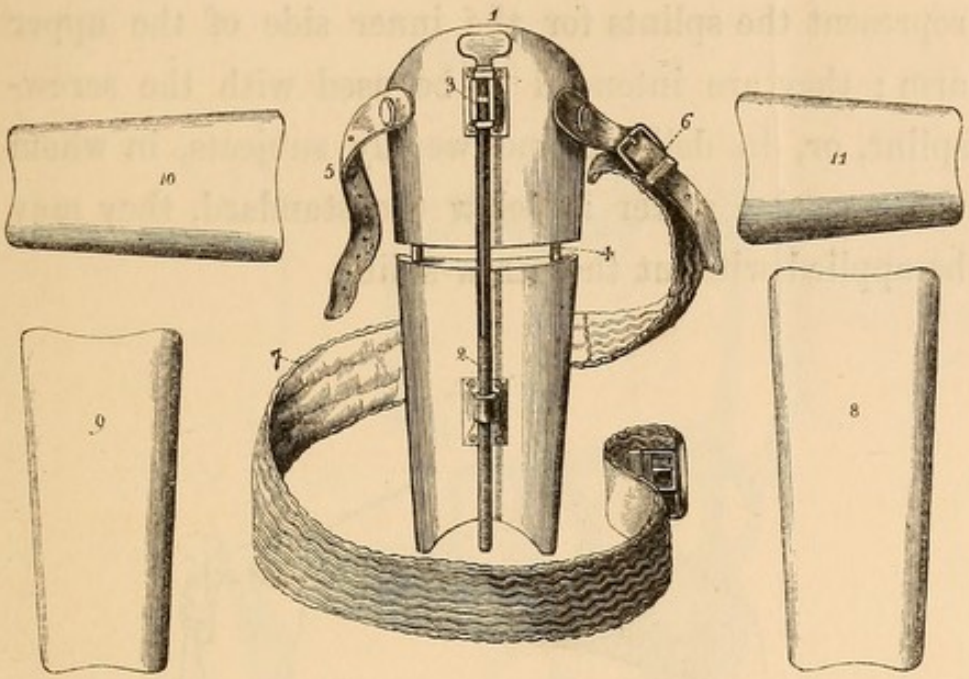


Fig. 1 represents the splints adapted for fractures of the humerus. No. 1 is a concave splint, capable of lengthening and shortening, by means of a long screw (2, 3), and fitted to the outer side of the upper arm. No. 4 indicates one of two metal pins, which secure the proper direction of movement of the upper and lower pieces of the splint when separated. Nos. 5, 6, and 7, are parts of a padded belt, intended to be carried round the chest of the patient, and beneath the axilla of the sound arm. This belt renders the upper part of the splint immovable, and at the same time fixes the scapula. The lower end of the splint

is concave, in order to protect the external condyle of the humerus from pressure. The figures 8, 9, 10, 11, represent the splints for the inner side of the upper arm; they are intended to be used with the screw-splint, or, in delicate and weakly subjects, in whom the muscular power is below the standard, they may be applied without the screw-splint.

Fig. 2.

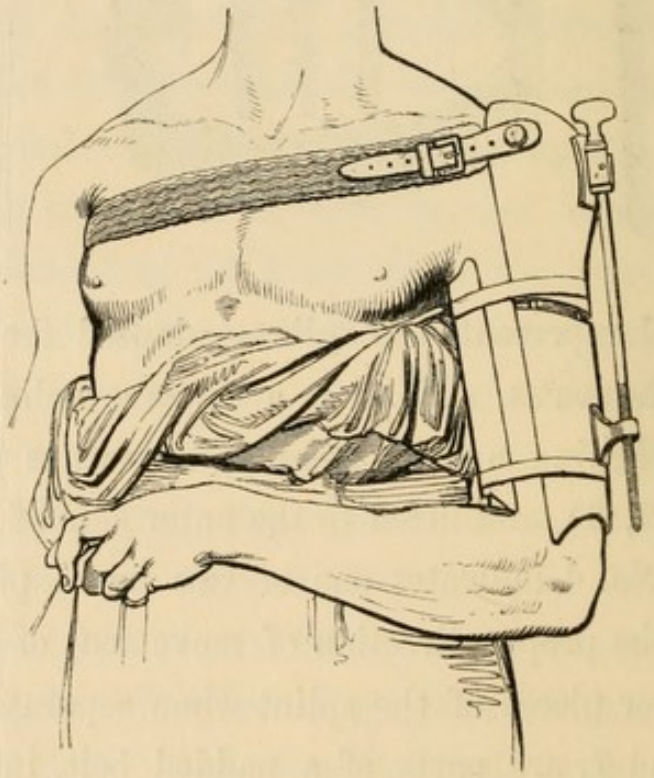


Fig. 2 represents the apparatus, shewn in the preceding figure, as applied to a fractured arm; the splints are adjusted to the length of the arm and

secured by straps. The position of the belt for the chest is also shewn.

Fig. 3.

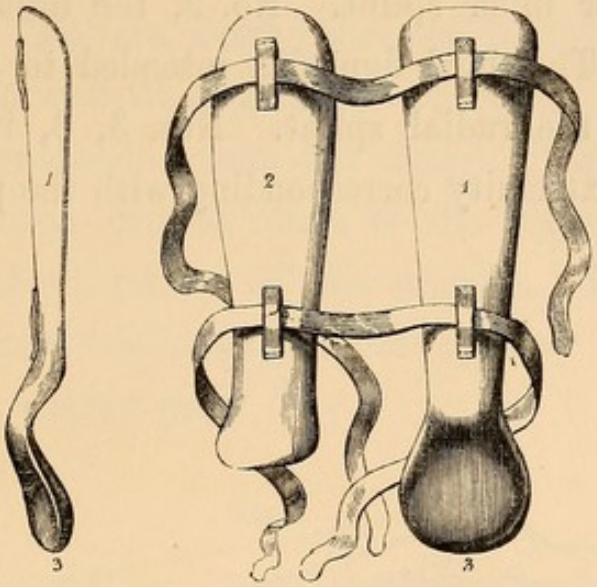


Fig. 3 represents the form of two splints for the treatment of fractures of the ulna and radius. The radial, or inner splint (1), is so formed as to adapt itself to the palm of the hand; it keeps the flexor tendons of the fore-arm extended, leaving the fingers and thumb at liberty, and has the effect of completely preventing pronation of the hand. The ulnar (2), or outer splint, extends no further than the carpal bones. Both splints are secured with broad straps: they are more perfectly kept in their place by continuing the upper strap round the humerus, just above

the condyles. When rightly applied, whether the arm be suspended in a sling, or hanging by the patient's side, or in any other position, pronation of the hand is most effectually prevented. No. 1, the radial, or inner splint. No. 2, the ulnar, or outer splint. The third figure is intended to give a side view of the radial splint. Nos. 3, 3, indicate the curved extremity corresponding with the palm of the hand.

Fig. 4.

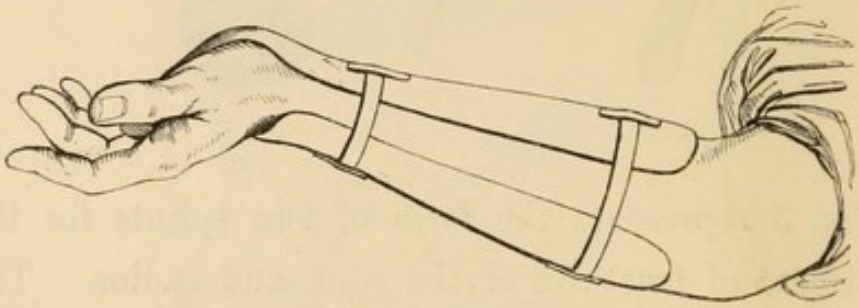


Fig. 4 represents the application of the splints for fracture of the ulna and radius. The artist in this woodcut has shewn the splints as not extending sufficiently towards the elbow joint. It is requisite that the ulnar splint should reach as far as the olecranon, and the radial to the bend of the elbow.

APPARATUS FOR FRACTURED CLAVICLE.

In presenting the following plan for the treatment of fractured clavicle, it may be right to premise its advantages. They are, firstly, that the parts are kept in apposition without excoriation. Secondly, that the arm is not suspended from the neck. Thirdly, that any application can be made to the region of the fracture without taking off the support. Fourthly, that the patient can undergo exercise, either in riding or walking, without pain.

Fig. 5.

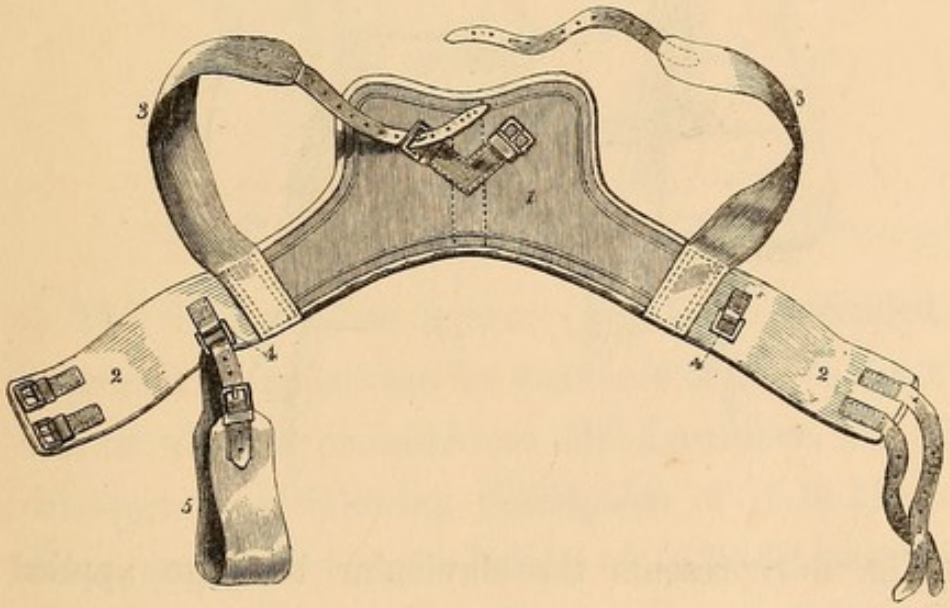


Fig. 5 is a view of the clavicular bandage, as laid flat on the table. No. 1 is the body of the bandage,

padded on the inside, and fitted to the hollow of the back; 2, 2, are padded belts, buckling on the front of the chest; 3, 3, are shoulder-straps, for fixing the shoulders and holding them back; 4, 4, are rings for sustaining a sling for the fore-arm of the injured side; 5 represents the manner of fixing the sling in fractures occurring on the left side.

Fig. 6.

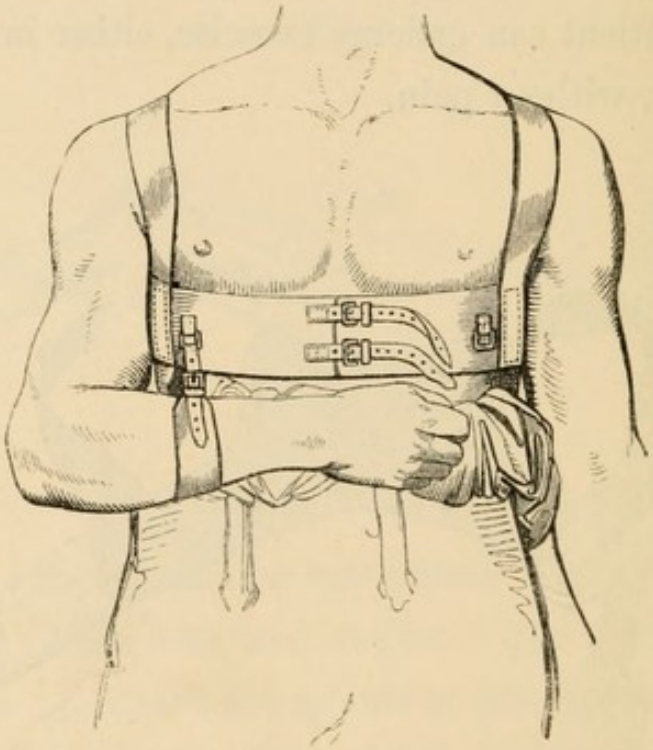
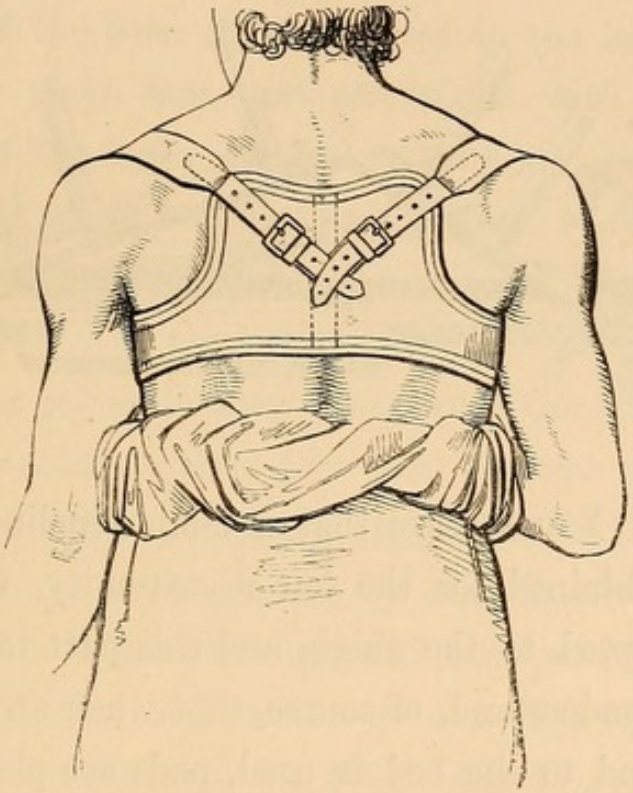


Fig. 6 represents the clavicular bandage applied and viewed from the front; the fore-arm is supported in the sling. Fig. 7 represents the same bandage, as seen from behind.

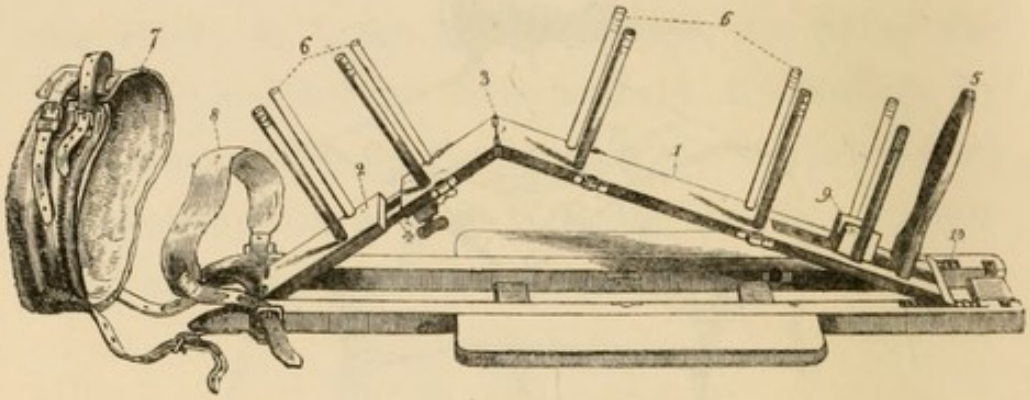
Fig. 7.



SPLINTS FOR THE LOWER EXTREMITIES.

The first of these figures (Fig. 8) is intended to represent an apparatus for fractures of the os femoris, one of which I presented to Mr. Lawrence, in 1829, who gave the following description of it in his Lectures, as reported in the Lancet of 1829-30, page 317. He says, " What I now shew you is a contrivance of this kind [speaking of double-inclined planes], to which a strap or band, calculated to fix the pelvis, is

Fig. 8.



attached. You observe that a double inclined plane is here obtained for the lower extremity, this part being adapted to the thigh, and this part to the leg. You will understand, of course, that when an addition of this kind to the bed is used, pads are placed over the wood, in order that the limb may lie easily. You will see that this apparatus is so contrived, that if care be taken, it presents a greater or lesser angle at the edge which corresponds to the ham; and that part which corresponds to the thigh is so constructed, that its length can be increased or diminished at pleasure, so as to accommodate the board to different individuals. In the first place, the length of the part on which the thigh is to rest, must correspond exactly with the length of the sound limb, the apparatus for which underneath enables you to lengthen or shorten the

various parts, and is very simple. Then the foot-board (5) can be placed at appropriate distances by means of the holes which you see in the lower parts, so as to make that part correspond with the exact length of the leg. The lateral pegs may be of use to retain the leg in any one part. Then the other end, facing the posterior part of the thigh, fixes against the tuberosity of the ischium, and this band (7) goes round the pelvis, to keep that part of the body steady. There is another band (8) used for the purpose of fixing the other portion of the thigh; so that, as far as it can be accomplished by this instrument, you render the thigh, the leg, and the pelvis, fixed."* But in this sketch there is a groove (9), constructed for the admission of the tendo Achillis, so as completely to prevent lateral motion of the heel. This groove I have added within the last three years.

No. 1. The tibial plane of the apparatus. 2. The crural plane, which may be lengthened or shortened at pleasure, by means of the adjusting mechanism, 4. 3. The hinge of the two planes, admitting of any increase of angle that may be required. 5. The moveable foot-board. 6, 6. Pegs, which may be removed or added at pleasure; they are intended to prevent the

* See also Medical Gazette, vol. vi. p. 429.

limb from slipping off the planes, and also serve to support pads. 7. A padded belt, to secure the pelvis. 8. Another belt, for the upper part of the thigh. 9. A moveable grooved piece, for supporting the tendo Achillis. 10. Brass racks, for regulating the elevation of the planes.

Fig. 9.

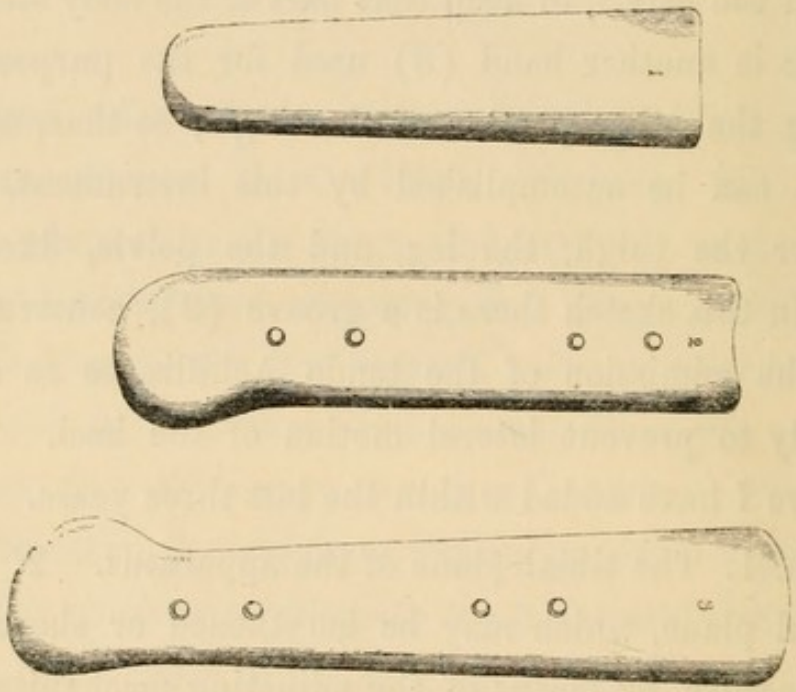


Fig. 9 represents the splints which I find the best adapted for fractures of the thigh bone. No. 1 is the anterior splint, the broader being the upper end. No. 2 is the inner splint, the number being placed near its upper extremity; the lower end is expanded

and concave, to receive the bulging part of the vastus internus and inner condyle of the femur. No. 3 is the outer splint, the rounded and expanded extremity being the lower end; this should extend from the trochanter major, to the outer condyle of the femur. The two latter splints have knobs for securing the straps by which they are fastened to the limb.

Fig. 10.

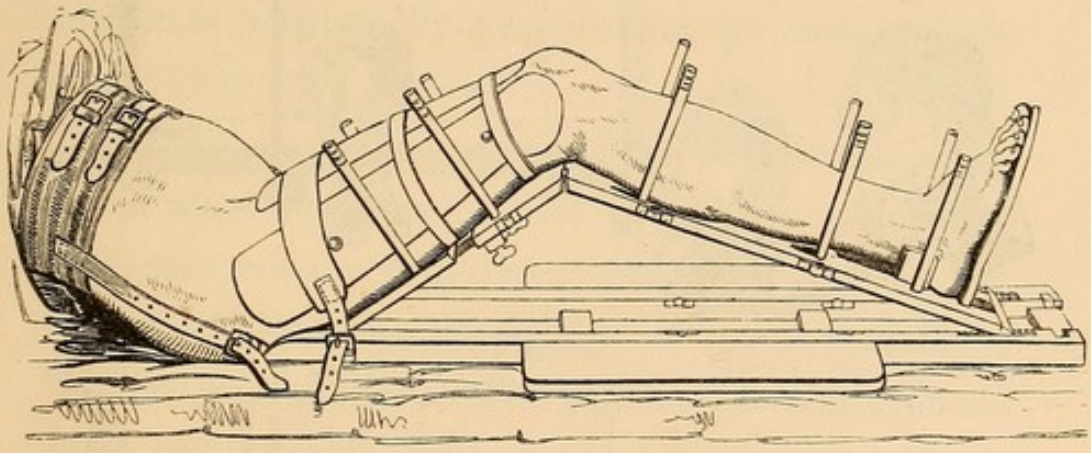


Fig. 10 represents the appearance of the apparatus and splints when applied. The belt should have been placed around the pelvis, instead of in its present position, and pillows beneath the limb have been omitted, in order to shew its precise position upon the apparatus.

APPARATUS FOR FRACTURES BELOW THE KNEE.

I shall now proceed to shew the method which I have used in fractures of the tibia and fibula. The following sketch of an apparatus represents a plan for suspending fractures below the knee :—

Fig. 11.

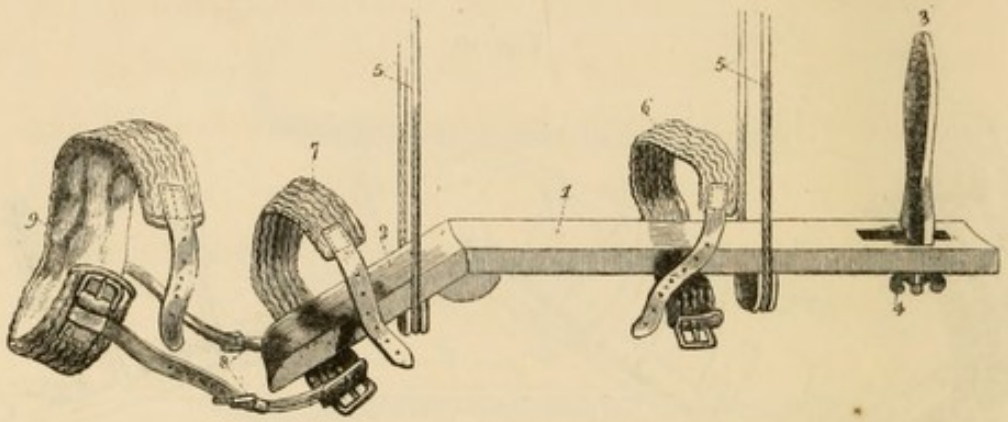
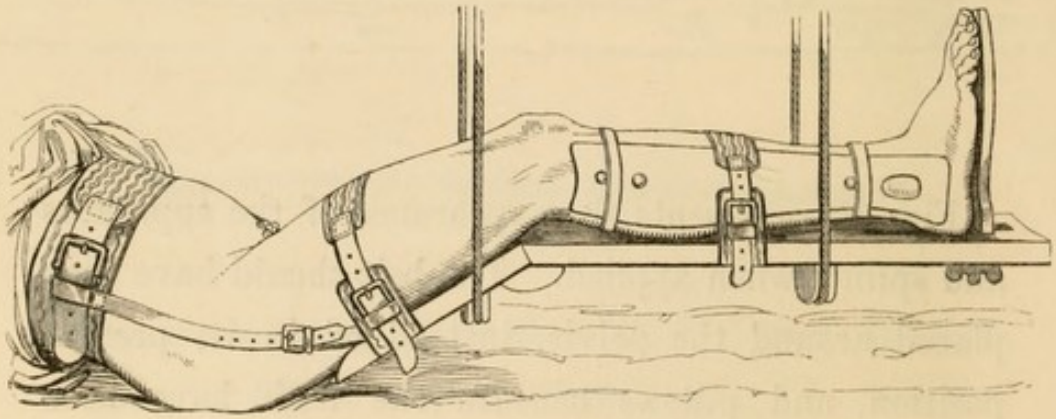


Fig. 12.



Figs. 11 and 12 represent an apparatus for suspending fractures of the tibia and fibula. In fig. 11,

No. 1 is the horizontal plane, for the support of the fractured limb; 2, is an inclined plane for the thigh; 3, is a foot-board, moveable at will by means of the screw and nut (4); 5, 5, are the ropes for swinging the apparatus; they are lodged in deep, pulley-like grooves, in two projecting pieces, below the apparatus; 6, a padded belt for securing the injured limb; 7, another padded belt for securing the thigh; 9, a padded belt for securing the hips and keeping the upper part of the apparatus in place; this latter intention is additionally provided for by means of the straps (8).

Fig. 12 shews the position of the limb on the apparatus when suspended. The pillows on which the limb rests when put up have been purposely omitted, in order to shew the adaptation of the apparatus to the form of the limb. The belt for the trunk should have been placed lower down—namely, around the pelvis, and if properly employed the patient is enabled to move in any direction. After reducing the fracture, the usual splints for the leg are applied; the limb is then placed on a pillow, or pad, over the plane of the apparatus, and secured thereon by means of a broad strap (6), and the proximal end of the apparatus is secured to the thigh and the pelvis by two straps, one round the thigh (7) and the other (9)

round the pelvis. The apparatus is suspended by two ropes to anything which may be contrived at the top of the bed, or over a couch. An air pillow placed under the nates tends much to the patient's comfort. The principle is due to M. Sauter, of Constance. It was afterwards published by M. Mayor, of Lausanne, who applied the suspension board to fractures of the thigh as well as those of the leg. His plan (which may be seen by referring to his work, published about seven years ago) I think not sufficiently applicable; neither is the motion of the swing so extensive as in the method I am now describing. I have at this time (August 9th, 1833,) a patient, an adult, with a compound fracture of the tibia (which happened July 28th) on the apparatus, who has experienced only a very slight catch of the limb on going to sleep; and so trifling is the inconvenience, that he has slept seven hours at a time; and, as a matter of course, the system suffers so much less from local and general irritation, a point of no small importance in the treatment of fractures. In conclusion, allow me to remark that all I claim in making public these adaptations of mechanism to surgical practice, is the humble merit of endeavouring to alleviate pain by giving a faithful description of those means which I have found effective in producing quietude in fractures of the extremities.

In corroboration of the utility of suspending fractures of the tibia, I beg to state that the wound of the patient mentioned above was healed on the twentieth day. Ossific union is now nearly completed, this being the twenty-ninth day from the time of the accident.

In the "Journal des Connaissances Medico-chirurgicales," there is a paper on the suspension of fractures, from the pen of M. Mayor, which I regard as so important in its tendency, and which sets forth the advantages of suspension so ably, that I shall make no apology for quoting it in this place.

"'L'Histoire Chirurgicale du Siège d'Anvers,' which Dr. H. Larrey has just published, records, methinks accurately, the present state of army surgery in France; and the general law laid down by him in his interesting work is the following (p. 280):— 'Amputate the thigh in every case of comminuted fracture complicated with gun-shot wound;' and the author, a few pages further on, (p. 311,) adds:— 'The head surgeon of the army earnestly insisted on the full application of the law, reduced in these cases to a single word, amputation.'

"And, indeed, the question having been affirmatively answered by the most eminent and deeply-read surgeons of our day, the solution carries with it all the authority of a demonstrated proposition.

"I, however, must appeal from the decision, and rest my opposition on the fundamental consideration, that the answer, although unanimous, is noways founded on *the nature of the lesion* itself, (and I can prove it,) but on the *imperfection of the means* we possess of maintaining the osseous fragments, and on the *defective apparatus* which in these serious cases is still had recourse to.

"In this, as in many other cases, the dressing is a consideration so fundamentally important, that if it were in our power advantageously to modify it and render it less offensive, the chances of success would be directly proportional to the extent of these modifications. For here we are circumstanced as in all surgical affections in which our greatest hopes of success are founded on the excellence of our instruments, and on the perfection of our deligatory apparatus; and if we be asked whether, in a given case, amputation is requisite, we should reply by another question, and in our turn inquire what means of treatment you possess? For, peradventure, if those means were detestable, you might reckon a mutilation for every fracture. There is, besides, a medical axiom familiar to all,—that the gravity or incurability of a lesion is never absolute, but only proportional, and in an inverse ratio of the therapeutic means opposed

to it; in such sort that an affection which to one practitioner may appear far beyond the reach of art, may yield with the greatest ease to the skill and experience of another. Consequently, unless it be argued and proved that the mode now adopted for dressing complicated fractures of the femur is the ultimate term of perfection, we may be allowed to hope, that, better understood, or combined in a more simple and rational manner, dressing may some day become a means of preservation in many cases in which ablation is not deemed indispensable.

"Let us, to throw more light on the question, divide it, and successively examine its two principal elements; *the state of the soft parts*, *the state of the bone;* and let us see what experience teaches us on each of these two sections separately considered, and examined independently one of the other.

"We shall find, and daily observation tells us, that contused and lacerated wounds of the muscular system are generally curable; and that a surgeon would be unpardonable were he in such cases to operate, especially where the lesions are not extreme. Again, we shall find that nature, well directed, easily triumphs over fractures, even though accompanied by some disorder in the surrounding tissues; and that a practitioner would fall into a serious error were he to reject

the *naturæ vis medicatrix*, and mercilessly mutilate all the poor wretches committed to his charge, who offered nothing but comminuted fractures with unimportant complications.

"What is it then that, in both these cases, gives so much confidence to the physician, and makes him reject all idea of amputation? Is it not evidently the power which in both cases he possesses, of doing all that he thinks indicated, and of avoiding all that he may judge decidedly hurtful? Thus, in wounds which do *not implicate the bone*, and which have been produced by projectiles deeply contusing and ploughing up powerful muscles, those of the thigh for instance, the lacerated parts may be laid wide open, covered with leeches, cataplasms, or other appropriate topics; and never need they be exposed to the irritating pressure of hard or heavy compresses; the dressings may be repeated frequently, and occasion neither trouble nor pain; the motions of the body and limb may take place without awakening the lively sensibility of the lacerated parts or disturbing the healing process, the patient is not necessarily condemned to keep his bed, etc., and all this *because the bone is entire, that it maintains the tissues in their normal position, and that osseous fragments are not constantly irritating the soft parts, as is the case wherever the bone itself has been shattered.*

"Again, when the femur is fractured, and the soft parts but slightly wounded, the surgeon may overlook the latter lesions to fix all his attention on the injured bone; he may neglect the soft and irritable tissue that surrounds it, so that he but succeed in fixing and re-uniting the fragments of the important object, *the broken bone.* He will not hesitate in applying around the limb loads of linen and compresses, of bandages and cushions; he will not hesitate to bind the whole up, and leave the limb for months encumbered in this clumsy apparatus; and that, because the state of the bone is *then* the important consideration, that its consolidation is his only aim, and that that aim cannot be attained (at least it is so said) but by the accumulation of all the retentive means which go by the name of *ordinary apparatus.* But is it not manifest that this very apparatus, with which the patient may recover in cases of simple fracture, must be evidently mortal in fractures with complication? Is it not to the apparatus that must be attributed the fatal results occurring in patients affected with fracture, accompanied by serious lesions of the surrounding tissues? The fact is so clear, that were you to apply it in cases of lacerated wounds *without fracture*, you would most certainly determine serious if not fatal accidents.

"Let us suppose a simple fracture of the leg, with

some lesions of the muscles, nerves, arteries, &c., of the corresponding thigh, or a simple fracture of a thigh-bone, coinciding with similar lesions of the corresponding leg; evidently in neither of these cases would you amputate, and most certainly you would not be over-anxious on the probable issue of the lacerated thigh, although the corresponding leg were broken; but you might experience some difficulty in properly dressing a fracture of the femur and wounds of the leg on the same limb. Even more: I may affirm that, whilst, in the first place, the lesions of the thigh would cure of themselves, those of the leg, in the second, would give you serious alarm, and that, if you had recourse to your ordinary fracture apparatus, you would run the risk of determining accidents which might, sooner or later, necessitate the ablation of the limb.

"Practitioners will appreciate the value of these reflections, and perhaps they will call their attention to the necessity of simplifying, even in simple fractures, our different means of retention. The best apparatus would be undoubtedly that which would leave the limb entirely free, as though the bone were sound, and the lesion were limited to the soft parts. Now, that apparatus really does exist; it is within everybody's reach, as we shall presently see, and it can be so accurately adapted to the nature of

the lesion, that its effects can never complicate, but must always tend to ameliorate its condition.

" From all we have just said, it results that the problem may be thus couched:—

" *To find an apparatus which may permit the surgeon to neglect the pathological state of the bone, and enable him to concentrate all his attention on the lesions of its surrounding tissues.* These are, in reality the vital parts, and where their laceration is not so extreme that all idea of preservation is ridiculous, I should lay down the following rule—'*never amputate, whatever may be the state of the shattered bone,*' but have recourse to an apparatus which will give the surgeon elbow-room, and place the patient in the same condition as though the bone were entire, and that the only indications were to manage soft tissues more or less grievously lacerated. If, however, you cannot make use of this precious resource, or if you think you possess sufficient motives to bear you out in the use of the ordinary apparatus, then, indeed, you will do right to assert and loudly to proclaim the principle—*amputate in all serious complications of fractures in general, and in those of the femur in particular.*

" The question is consequently reduced to a simple question of apparatus, and its solution may be given

in the following terms: *amputation is always indicated when, in the treatment of complicated fractures, recourse must be had to an apparatus incompatible with the exigencies of those fractures —amputation is never indicated when a suitable apparatus may be procured.**

" But an apparatus, to be really suitable, must fulfil the following conditions: it must allow the surgeon to make free use of the bistoury, at a moment's notice, at all times; it must permit him to observe and treat the inflammation, abscesses, hæmorrhage, gangrene, &c., that may supervene; to apply ice, cold water, leeches, topics of every description, as often and as long as he thinks proper; to set aside all that might wound or irritate the tissues; to render his dressings painless and easy; to move the body and the wounded limb without irritating the fracture or aggravating the state of the lacerated parts; to remove the patient from his bed whenever necessity may require, that he may enjoy the benefit of fresh air and fresh linen; lastly—and this is of the greatest importance, the logical consequence of what has just been said—all this must take place as though the bone remained entire, and maintained all the tissues

* Nouveau Système de Déligation Chirurgicale.

in their normal position; in such sort that the two extremities of the broken bone be immoveable, and be not incessantly borne on the soft parts, as always happens when the bone, maintained by the common apparatus, undergoes some change of position.

" The surgical instrument which possesses all these advantages is the more precious that its application is most simple and easy; it is the suspended board of Sauter, which I have somewhat modified, and elsewhere described. Here I can only add one most important practical consideration, that apparatus, duly and properly applied, insures the patient against all amputation, and often, where an operation is indispensable, assures the success of that operation. Thus, the surgeon is seldom called before accidents of a serious character have supervened, and when it would be highly imprudent to add to the circulatory, the nervous, the functional derangement, all the consequences that an important operation must necessarily give rise to; or else he is called in when some considerable disorder has suddenly started up, and the conservation of the limb appears no longer possible; yet it is evident that its ablation cannot take place until conditions more favourable to the success of the amputation be previously obtained. In either of these cases, Sauter's suspended board is the simplest

and the safest means which can be had recourse to, and permits the operator to temporize for a while, and make use of all the general modifiers of the economy, without which, in such cases, the best performed operations are constantly unsuccessful.

"I feel that I ought now to verify my deductions by facts, and I should be happy to choose, amongst those most serious cases, fractures from gun-shot wounds: the verification would be decisive, and would, besides, solve the question, both for the upper and lower extremities. But I must confess, that in these particular cases I have but little to offer to those who, not aware of all the practical bearing of the new apparatus, would wish to judge it by repeated trials. Nevertheless, if analogy be admitted, and that too much distinction be not made between gun-shot fractures and those produced by other contusing bodies, I may instance a certain number of fractures, complicated by all the lesions resulting from falling blocks of stone, carriage wheels, horse kicks, &c.; I may even cite a comminuted fracture, determined by a musket-shot which passed through the inferior extremity of the leg, and shattered both bones. I may add, that I have treated femurs shattered to pieces, and whose osseous fragments had worked their way outwards, and lacerated all the surrounding tissues.

All these cases were treated by means of the suspended board, and *all* cured without deformity or accident. Perhaps I may be allowed, by analogy or induction, to adduce the following fact—at least it may appear worthy of mention, as a fracture artificially complicated, and because it offers the practitioner a new mode of combating abnormal articulations.

" Isoz David, aged 28, had fractured the middle part of his thigh early in 1828—five months after there were no signs of consolidation.

" Having for three more months attempted, but in vain, to modify this false articulation, I determined on the following operation. I inclined the oblique fragments of the femur, so as to enable me to slide between them a large trocar. I left its canula eight hours in the same position, and through the metal tube I repeatedly introduced a steel stem, which I had previously steeped in boiling water; by the contact of the hot iron and the pseudo-articular surfaces of the abnormal articulation, I intended to inflame these last sufficiently to provoke a beneficial anchylosis. I consequently placed the limb on the suspended board; by the appropriate application of topics, I succeeded in modifying a considerable phlegmonous tumefaction, gave a free issue to the pus, by

a long and deep incision, and submitted the limb to all the dressing I deemed beneficial. In the space of three months I had perfectly attained the end I aimed at, and the young man left the hospital of Lausanne cured.

" The following case I think not entirely devoid of interest:—

" Emmanuel Dubois, workman, aged 64, was struck, on the 26th of July, 1828, by a rammed ball, which penetrated four inches above the left knee, and which, after fracturing the femur, directed itself obliquely downwards and outwards, and lodged in the neighbourhood of the articulation, where it still remains. Drs. Flaction and Junod, immediately sent for, freed the wound, and did what they could to find and extract the projectile. Called on the following day; I merely placed the limb, half inflected, on the suspended board, and covered it with emollient applications. The patient remained three months on the apparatus, and had full time himself to appreciate its advantages. With the exception of some fever, and the sufferings in all such cases inevitable, no serious accidents supervened; at the beginning, several fragments, and, latterly, two large pieces of necrosed bone, one of which measured two inches long, and was in thickness equal to half

the femoral cylinder, made their way through the teguments. In five months' time the wound was healed, and Dubois began to walk. A slight shortening, proceeding from loss of substance, and which a thick-soled shoe completely remedies, is the only remaining trace of his accident. The play of the articulation is perfectly free, and Dubois now (July, 1833) supports hard walking and fatigue as well as most men of his age: last year he walked thirty-six miles in one day—from Yverdon to Lausanne, and back again. And this cure was operated on an old man, addicted to drink, in the cottage of the poor, and with so little surgical accommodation, that the patient used to dress his own wound, and he himself extracted the fragments of his necrosed femur. All these results will no longer astonish, when, after having formed an exact idea of the apparatus and its mode of action, it has been submitted to the following trials:—

"1. Place one of your own thighs on the suspended board, taking all necessary precautions, and have your other thigh fixed in the ordinary apparatus. Remain thus till you yourself have duly appreciated the relative value of this mode of action.

"2. Break or saw the femur of a corpse; lay open the two extremities of the fractured bone, and place

the limb, with proper care, on the suspended board; fix it, and suspend, and remark what motions take place in the bone when the apparatus or the body is moved or turned in any direction; and then candidly confess whether you have not cause to regret that so simple and safe a method should be so generally and so unaccountably abandoned, and whether, at the siege of Antwerp, it had not rendered unnecessary more than one mutilation, and saved more than one brave fellow's life.

" *Synopsis.*—1. Amputation is useless in most cases of complicated fracture.

" 2. If many surgeons have been compelled to have recourse to it, it is solely because a proper apparatus was wanting.

" 3. An apparatus, to be truly applicable, should maintain the osseous fragments immoveable in their juxta-position, and permit the surgeon to dress the lesions of the soft parts, as though these last were alone affected.

" 4. The state of the fractured bone ought rarely to influence the surgeon's opinion with regard to the propriety of an operation.

" 5. The laceration of the soft parts can only in extreme cases prove a determining cause.

" 6. Whenever those lesions, whatever they be,

offer some chance of cure, all ideas of the fracture being completely set aside, amputation is never justifiable.

" An amputation is never absolutely, urgently indispensable, but when the surgeon has not beside him the means of treating the serious lesions, of all descriptions, that complicate fractures, as though those fractures did not exist.

" 8. The only apparatus which to my knowledge can permit of a similar medication, is that which I have elsewhere described under the name of *hyponarthecia.*

" 9. This apparatus is likewise indispensable in all cases in which the preservation of the limb being deemed impossible, it is judged prudent to defer the ablation until the general and local health of the patient be sufficiently restored to render an operation less hazardous.

" M. MAYOR,

" Head Surgeon of the Lausanne Hospital."

In illustration of the same subject, I may be permitted to quote an extract from an eye-witness of the method of suspension employed in Lausanne. The writer is Dr. Wigan, a gentleman distinguished by many original observations and researches.

" It was about the year 1820, that Mr. George

Young—the most successful of London surgeons, having made a fortune perfectly unprecedented by any man not attached to a hospital school—returned from a tour in Germany. He had entirely relinquished his practice, but still took great interest in suggesting improvements to his professional friends, and in the course of one of his friendly explanations, shewed me an apparatus, which he had witnessed in Germany, for the management of fractures. It was a shelf, suspended by four cords from the corners; and he spoke in the highest terms of the advantages it possessed over the ordinary modes of management, that the limb being suspended, enabled the patient to get out of bed without disturbing it. It was in vain that I endeavoured to comprehend its advantages; and being a tolerable mechanic, I could not help regarding it as a clumsy contrivance, and thought no more about it. My practice in London had a very small admixture of surgery, and the thing passed away from my memory.

"In the year 1826 or 27, I resided several months at Lausanne, where the apparatus was pointed out to me by Mr. Mayor, the surgeon to the hospital there, as the invention of a German, not, I believe, a medical man. I now saw that Mr. George Young had repeated the old story of the French cook—he

had made the plum-pudding quite correctly, but omitted the cloth—he had shewn the mode of suspending the broken limb, but had forgotten that four points of suspension allowed no motion, and entirely neutralized the principle; that it was only on tying all four together, at a convenient distance from the board, that you obtained the *universal joint* of mechanics—the ball and socket.

"The moment I saw this, I comprehended in an instant its numerous advantages, and found that it might be rendered useful in a great variety of cases, not merely fractures of the lower limbs, but of the arm, and many other injuries; might be the means of preventing anchylosis, by removing the necessity of confinement to one position, &c.

"I saw it employed in many cases at Lausanne, and was the means of introducing it into some parts of Italy and France; but although I had often seen patients get in and out of bed without any assistance, and without risk of disturbing the limb, and spared no asseverations to convince, it was rare that I could get any one to comprehend fully the extreme simplicity and perfection of the apparatus, and I was often unsuccessful. I have observed all over Europe, that surgeons are miserable mechanics, and have seen many apparatus by common bone-setters, Greeks,

Germans, and Dutch, which would shame our hospital surgeons.

"On my return to England, I endeavoured in vain to get the plan adopted in various hospitals, but as I soon after left London, and removed to a country town, it is not surprising that I was even less successful there; for although it contained a hospital and a large population, it was not large enough to remove the jealousy which is the besetting sin of the profession. I should believe that I myself partook of the feeling, if I did not know that "*oneself*" *is always exempt from prejudice*, and that it is only 'others' who are influenced by that odious defect.

"In passing from Lausanne into Italy, I found a lady (the Hon. Mrs. H.) at a miserable cottage in the high Alps, who had been six weeks on the floor, having broken her leg by the fall of the mule, in passing over the Wengern Alp. Serious injury was coming on in various parts of the body, from confinement to one position. On the application of the new apparatus, she was immediately able to rise; her gratitude was unbounded, and her recovery so rapid, that a few weeks afterwards I encountered her at Milan, quite restored.

"For many years I have given up surgery altogether, and do not know whether the plan I speak of is

become more general—it well deserves to be so; but I believe it is the very simplicity of the contrivance which constitutes the obstacle to its adoption.

" Dr. Mayor never claimed the merit of the invention, but he made great efforts to teach the peasantry of the mountains the use of the apparatus, which was within the means of any one to construct—a matter of importance in their insulated life, where they could not procure surgical aid at any price, (even if they could afford it,) for five or six months together.

" The mode of fastening which I saw in Switzerland, was rather clumsy and complicated. I substituted the *guy*, which I think is an improvement."

CASE I.—ILLUSTRATIVE OF THE ADVANTAGES OF SUSPENSION.

Since my report of the favourable termination of a case of compound fracture of the tibia, elucidating the advantages of suspension, I have been engaged in the treatment of another, which has proved no less satisfactory. A young man, nineteen years of age, in the full vigour of health and strength, received a simple comminuted fracture of the lower third of the tibia, in consequence of a heavy draught horse falling on him. The horse fell in such a manner that the

injured leg lay under the collar, by which the bone was crushed into at least six pieces. After putting the limb into loose splints, I suspended it, according to the plan described at page 14. I then took a pint of blood from the arm, gave an aperient, and treated the case on general principles. Ossific union was effected on the twenty-second day.

The most singular feature in this, as well as in the former case, is the very limited deposition of callus round the broken ends of the bone, especially in the former instance, where the fracture was transverse. The case alluded to was seen by four medical men, who can corroborate the accuracy of my account. If these statements should be borne out by future experience, it will be in opposition to that part of Bichat's work, wherein he says, "The regular forms of the sound bone are not to be expected here, because the parenchyma of nutrition arising irregularly over the surface of the organ, the exhalation and absorption of gelatine cannot be performed in a precise and regular manner."*

* Page 100, in his third volume of "General Anatomy."

CASE II.—SHEWING THE ADVANTAGE OF THE SUSPENSION APPARATUS IN FRACTURES.

Anxious to attract the attention of the profession generally to the further consideration of the beneficial effects of suspension in the treatment of fractures of the lower extremity, I beg to offer an account of a patient upon whom I am at present in attendance.

— Copley, a bricklayer's labourer, bearing a hod of bricks on his shoulder, fell from a scaffold ten feet from the ground. He dislocated the ankle joint inwards, and fractured the fibula at about three inches above its lower end. The accident occurred on the 22nd of July, 1835. On the following day, I placed the limb on the suspension apparatus, as before described. The patient was assisted out of bed, and sat in a chair, with the fractured limb suspended by a cord attached to the ceiling. It is now the twenty-fifth day; ossific union has taken place; there is no tenderness of the joint, neither has he suffered severe pain, although there was much tumefaction and extravasation. He has not been confined to his bed one whole day since the accident occurred.

THE EFFECT OF FRACTURES ON THEIR SURROUNDING PARTS,

MORE PARTICULARLY IN REFERENCE TO FRACTURES OF THE LOWER EXTREMITY.

I SHALL, in the first place, endeavour to give a general description of each structure, with some pathological remarks; and, in the second, make some observations on the diagnosis and treatment.

I.

"In structure, bone is composed of lamellæ, which are concentric in long, and parallel in flat bones. Between the lamellæ are situated numerous small longitudinal canals, and minute oval corpuscles. The longitudinal canals (canals of Havers) contain medullary substance and vessels, and communicate with each other and with the medullary canal or cells; they are surrounded by minute concentric laminæ, crossed by radiating lines (tubuli). In the extremities of long, in short, and in flat bones, the cells represent the Haversian canals, and are each surrounded

by concentric laminæ, and the medullary canal of long bones may indeed be considered as a single Haversian canal, exceedingly dilated. The oval corpuscles are minute cells, from which are given off a number of radiating and branching tubuli, which anastomose with the corresponding tubuli of neighbouring cells. The cells and tubuli are filled with calcareous substance; hence they have been named calcigerous cells and tubuli. In the fresh state, bones are invested by a dense fibrous membrane, the periosteum, covering every part of their surface, with the exception of the articular extremities, which are coated by a thin layer of cartilage. The periosteum of the bones of the skull is termed pericranium, and the analogous membrane of external cartilages, perichondrium. Lining the interior of the medullary canal of long bones, the Haversian canals, the cells of the cancelli, and the cells of short, flat, and irregular bones, is the medullary membrane, which acts as an internal periosteum. It is through the medium of the vessels supplying these membranes, that the changes required by nutrition occur in bones, and the secretion of medulla into their interior is effected. The medullary canal of long bones, and the cells of other bones, are filled with a yellowish oily substance —the medulla, which is contained in a loose cellular

tissue, formed by the medullary membrane. The earliest trace of skeleton in the human embryo is observed in the existence of semi-opaque lines, which are seen through the transparent embryonic mass. This trace is composed of a consistent granular jelly, and constitutes the gelatinous state of osteo-genesis. In the second, or cartilaginous state, the semi-opaque jelly becomes dense, transparent, and homogeneous, the change taking place from the surface towards the centre, and constituting cartilaginification. In the third stage, the cartilage is traversed by vessels carrying red blood, which proceed from the fibrous investment, and ramify in its interior. The cartilage immediately surrounding these vessels becomes opaque, and of a yellowish red colour. In the fourth stage, the earthy constituents are attracted from the blood by the opaque cartilage, which becomes altered in character, and shoots into the transparent cartilage in the form of reddish grey fibres, which communicate with each other at acute angles, and constitute an areolar osseous tissue. This is the state of ossification. The succeeding changes are those of condensation, and the formation of cells, Haversian and medullary canals. Cartilaginification is complete in the human embryo at about the sixth week, and the first point of ossification is observed in the clavicle about the

seventh week. Ossification commences at the centre, and thence proceeds towards the surface. In flat bones, the osseous tissue radiates between two membranes, from a central point towards the periphery; in short bones, from a centre towards the circumference; and in long bones, from a central portion, (diaphysis,) towards a secondary centre, (epiphysis,) situated at each extremity. Large processes, as the trochanters, are provided with a distinct centre, which is named apophysis.

"The growth of bones in length, takes place at the extremity of the diaphysis; and in bulk, by fresh deposition on the surface; while the medullary canal is formed and increased by absorption from within."

"The period of ossification is different in different bones: the order of succession may be thus arranged:—

During the fifth week, ossification commences in the clavicle, lower jaw, and upper jaw.

During the sixth week, in the femur, humerus, tibia, radius, and ulna.

During the seventh and eighth weeks, in the fibula, frontal, occipital, sphenoid, ribs, parietal, temporal, nasal, vomer, palate, vertebræ, three first pieces of the sacrum, malar, metacarpus, metatarsus, third phalanges of the hands and feet, and ilium.

During the third month, in the first and second

phalanges of the hands and feet, lachrymal bone, and ischium.

During the fifth month, in the mastoid portion of the temporal, ethmoid, inferior turbinated, sternum, os pubis, and two last pieces of the sacrum.

During the sixth month, in the body and odontoid process of the axis and calcaneus.

During the seventh month, in the astragalus.

During the tenth month, in the cuboid bone and os hyoides.

During the first year, in the first piece of the coccyx, inferior turbinated bone, last piece of the sternum, anterior arch of the atlas, os magnum, os unciforme, and external cuneiform bone.

During the third year, in the cuneiform of the carpus, internal cuneiform, and patella.

During the fourth year, in the middle cuneiform and scaphoid of the tarsus.

During the fifth year, in the trapezium and os semilunare.

During the seventh year, in the second piece of the coccyx.

During the eighth year, in the scaphoid of the carpus.

During the ninth year, in the os trapezoides.

During the twelfth year, in the os pisiforme and third piece of the coccyx.

During the eighteenth year, in the fourth piece of the coccyx.

The ossicula auditûs are the only bones fully ossified at birth.*

Bones may be classed into three distinct states—the mucous, the cartilaginous, and the osseous; and in the union of fractures we have three processes—1st, the development of granulations; 2ndly, their transformation into cartilage; 3rdly, the change of this cartilage into bone. This process requires time, according to the age and health of the patient, from twenty to sixty days. If the fractured parts be not kept from motion, and the parenchyma of cicatrization is prevented from uniting, an unnatural union will be formed, notwithstanding the effusion of the nutritive substances. The effects of fractured bone on the neighbouring parts are contusion, laceration, and effusion. In the cartilage of joints animal sensibility is never met with, but mere insensible organic contractility or tone, and that in an obscure degree. Sympathies are almost wanting in this system, so that inflammation must assume a chronic type, unless we admit of this comparison. For instance, an inflammation of the cellular tissue assumes an acute form

* Vide Wilson's "Anatomist's Vade Mecum."

when it lasts only a few days, and a chronic one, when it exceeds thirty or forty. Now, in a cartilage, this last term may characterize an acute stage, whilst a succession of several months is required for a chronic one, instances of which are so frequently met with in diseases of the articulations. The fibrous tissue, which includes the tendons, ligaments, and periosteum, can only be known by negatives; it has not the sensibility of the nervous structure, nor the contractility of the muscular; it only obeys the action imparted to it. Nevertheless, vital activity in this structure is greater than in bone and cartilage, as it is more frequently the seat of pain from laceration and inflammation. In a natural state, I said it was destitute of nervous sensibility, but in a morbid state it is highly sensitive. It is worthy of remark, that inflammation of this structure never produces suppuration. Pus is never secreted by the fibrous structure, and for this reason, that the fibrous tissue has very few vessels. In this structure, sympathies of every description are met with. All that is known respecting the nature of the muscular fibre is, that it differs from others; that it cannot be compared either with the tissue of nerves or vessels, or with that of tendons or of cellular tissue. Now we shall find, that in this point of view, all these systems differ essen-

tially from each other; that, consequently, there cannot exist the slightest analogy between them in what regards their nature, from which the properties are constantly derived. In muscle, the two great sensations of life are very manifest; namely, animal and voluntary sensation. Inflammation prevents contraction in a muscle; laceration, contusion, and effusion, tend to impede animal contractility in the muscle. A deficient supply of blood to a muscle relaxes its powers. *The muscle must be in a state determined by the laws of its organization, to answer to cerebral excitement.* The muscular system acts a very important part in sympathies, which never take place without the two-fold action of the brain and nerves. The cellular tissue gradually decreases in the extremities, from above downwards: it is permeable throughout, yet it varies in density; indeed, this structure can only be regarded as a reservoir for fat and lymph. The cellular serum is much increased or diminished during digestion or after sleep, in consequence of the perspiration. It is well known that, in anasarca, the quantity of cellular serum is increased, and that it is entirely suspended in inflammation: there is no doubt but this fluid contains particles for nutrition. The fat is found in greater abundance in the upper portion of the ex-

tremities and in infants. There is also another peculiarity in fat—namely, that whereas it occupies the subcutaneous tissues chiefly in young persons, in the old it is deposited within the cavities of the body, and upon the viscera, as upon the heart, &c. The animal properties do not reside in this structure until it becomes morbidly affected, as, for instance, in phlegmonous inflammation, &c. The healing art is indebted to Corvisart for having demonstratively shewn that almost all infiltrations of the cellular structure are symptomatic. The cellular tissue undergoes the same changes as the skin. From what has been remarked, the vitality of this membrane is very superior to the other organs with which it is classed, as fascia, tendons, cartilages, and ligaments. Suppuration takes place in this structure with a suddenness to which few organs afford a parallel. Granulations and cicatrizations may be said to have their origin in this structure. The cellular tissue which surrounds the arteries is never the seat of serous effusion, nor does fat ever accumulate there: it is *rarely* attacked by inflammation. The veins are provided with a similar covering or texture, but much less dense and firm; it likewise contains no adipose substance, secretes little serum, suffers no distension in dropsies. The cellular substance envelopes the

muscles, the arteries, the veins, and, without doubt, the absorbents, forming, as Bordeu has so happily expressed it, an atmosphere for each. To the separation of life in the different organs, through the means of the surrounding cellular structure, reference must be made to explain the absolute distinctness of disease; nevertheless, experience shews that it is also an agent to convey disease. Effusion of serum, air, or blood, either separately or combined, takes place in the cellular structure, subcutaneous and cutaneous tissues. The effusion of serum appears to take place in the subcutaneous cellular tissue in a much larger proportion than in other parts: it has a particular tendency to accumulate there, in consequence, without doubt, of the laxity of this membrane, and the large size of the areolar spaces. The sub-mucous cellular tissue is connected with the cellular tissue of the skin, from which both are continued, and with which there is an analogy of structure, but with this difference—the density of the former is less than the latter.

"The skin is the exterior investment of the body, which it serves to cover and protect. It is continuous at the apertures of the internal cavities with the lining membrane of those cavities,—the internal skin, or mucous membrane; and is composed essentially of two layers, the dermis and epidermis.

"The dermis, or cutis, is chiefly composed of areolo-fibrous tissue, besides which it has entering into its structure, elastic and contractile fibrous tissue, together with blood vessels, lymphatic vessels, and nerves. The areolo-fibrous tissue exists, in its most characteristic form, in the deeper strata of the dermis, which are consequently dense, white, and coarse, while the superficial stratum is fine in texture, reddish in colour, soft, raised into minute papillæ, and endowed with an abundant supply of vessels and nerves. This peculiarity of structure of the dermis, has given rise to its consideration as consisting of two layers—the superficial or papillary layer, and the deep stratum or corium.

"The epidermis, or cuticle, is a product of the dermis, which it serves to envelope and defend. That surface of the epidermis which is exposed to the influence of the atmosphere and exterior sources of injury, is hard and horny in its texture, while that which lies in contact with the sensitive papillary layer of the dermis, is soft and cellular. Hence this membrane, like the dermis, offers two strata for our observation, the outermost stratum, commonly spoken of as the epidermis, and the innermost stratum, or rete mucosum. The latter was considered and described by Malpighi as a distinct membrane, and is

frequently referred to under the name of rete Malpighianum.

" Besides the dermis and epidermis, the skin includes certain important secreting organs, and certain appendages of the epidermis, which call for separate notice. The secreting organs are the sudoriparous and sebaceous glands, and the appendages of the epidermis, the hairs and the nails.

" The dermis presents considerable variety in degree of thickness in different parts of the body. Thus upon the more exposed regions, as the back, the outer sides of the limbs, and the palms and soles, it is remarkable for its thickness; while on protected parts, as the inner sides of the limbs, and the ventral surface of the trunk, it is comparatively thin. On the eyelids, the penis, and the scrotum, again, it is peculiarly delicate. The papillary layer also presents differences in extent of development; thus on the palms of the hands, the pulps of the fingers, and the soles of the feet, this layer is thick, and the papillæ numerous and of great length, while in most other situations it is thin, and the papillæ are little apparent. Some contrariety is observed, besides, in the relative proportion of the layers of the dermis, for on the back, where the corium is exceedingly thick, the papillary layer is but slightly developed, while on the pulps of the

fingers, where the latter is strikingly manifest, the corium is thin.

"The areolo-fibrous tissue of the dermis is constructed of fibres of two kinds—namely, of minute cylindrical fibres, which are identical in their nature with the delicate wavy fibres of common areolar, or cellular substance, and of fibres of elastic tissue, presenting their characteristically curved ends, and branching distribution. In the superficial strata of the corium, the white fibres are collected into small fasciculi, and form an intricate interlacement, which supports the papillæ, and constructs a nidus for the capillary rete of vessels and nerves. In the middle strata, the fasciculi are larger and flattened, and the areolar network coarse; while in the deep layer, the fasciculi are still broader, they leave considerable spaces between them, which are occupied by adipose tissue, and they are continuous with the subcutaneous areolar membrane. The yellow elastic fibres are solitary in their arrangement, they are abundant in the superficial layers of the corium, but rare and scarcely met with in the deeper strata. The areolæ left by the interlacement of the fibres of the areolo-fibrous tissue, are the channels by which the branches of vessels and nerves find a safe passage to the papillary layer, in which, and in the superficial strata of the corium, they are principally distributed.

"The contractile fibrous tissue of the dermis has been demonstrated hitherto only in certain parts of the human skin, as in the nipples and scrotum, but it undoubtedly exists in the corium of every part of the body. It consists of fibres of a reddish hue, somewhat larger than those of areolar tissue, and semi-transparent. These fibres are collected into fasciculi, sometimes lying parallel with each other, and forming membranous layers, at other times interlacing in every direction, and composing a firm web. They are met with in every part of the corium, but are most abundant in the coarse network of its under surface. This tissue is easily perceived in the corium of some animals, where it forms a web around the sebaceous glands and hair follicles. It probably has the same arrangement in the skin of man; in the former situation acting as a compressor of the sebaceous gland, and an important auxiliary to the current of its secretion; in the latter producing an erection of the hairs analogous to the bristling which takes place in animals. That appearance of the skin produced by cold or fear, (spasmus periphericus,) that we term *cutis anserina*, or goose-skin, is due to the presence of this contractile fibrous tissue.

"Mr. Bowman* has indicated the presence of

* Cyclopædia of Anatomy and Physiology. Article, Mucous Membrane, Note, p. 494.

organic muscular fibre in the tissue of the dartos, 'at once known by its being loaded with corpuscles or persistent cell-nuclei.' The same fibres probably exist in the contractile tissue of the nipple.

"The papillary layer of the dermis is raised in the form of conical prominences or papillæ. Upon the general surface of the body the papillæ are short, and exceedingly minute, but in other situations, as on the palmar surface of the hands and fingers, and on the plantar surface of the feet and toes, they are long, and of large size. They are also different in their arrangement in the situations above cited; thus, on the general surface, they are distributed at equal distances, and without order, whereas, on the palms and soles, and on the corresponding surfaces of the fingers and toes, they are collected into little square clumps, containing from ten to twenty papillæ, and these little clumps are disposed in parallel rows. It is this arrangement, in rows, that gives rise to the characteristic parallel ridges and furrows which are met with on the hands and on the feet. The papillæ in these little square clumps are for the most part uniform in size and length, but every here and there one papilla may be observed which is longer than the rest. The largest papillæ of the dermis are those which produce the nail; in the dermic follicle of the nail they are

long and filiform, while beneath the concave surface of the nail they form longitudinal and parallel plications, which extend for nearly the entire length of that organ. In structure each papilla is composed of a more or less convoluted capillary, and a more or less convoluted nervous loop.

" The arteries of the dermis which enter its structure through the areolæ of the under surface of the corium, speedily divide into innumerable intermediate vessels, which form a rich capillary plexus in the texture of the superficial strata of the dermis, and in its papillary layer. In the former situation the capillary rete is horizontal—that is, it corresponds with the plane of the surface of the skin, while in the papillæ it is necessarily the reverse of this—namely, perpendicular to the plane of the surface. To see the capillary plexus of the papillæ, it consequently becomes necessary to examine the injected skin by means of a vertical section, but if the horizontal rete is to be observed, no section is needed. In the papillæ of some parts of the dermis, as in the longitudinal plications beneath the nail, the capillary vessels form simple loops, but in other papillæ they are convoluted to a greater or less extent, in proportion to the size and importance of the papillæ. The capillary rete of the horizontal strata presents, as may be inferred, a

number of circular areæ, some of which appear to correspond with the bases of the papillæ, while the greater number occupy the walls of the passages through which the sudoriferous and sebaceous ducts make their way to the surface. After a certain extent of course, the intermediate vessels unite to form the veins by which the circulated blood returns to the system.

"The lymphatic vessels probably form in the superficial strata of the dermis, a plexus, the meshes of which are interwoven with those of the capillary and nervous plexus. No lymphatics have as yet been discovered in the papillæ, nor, indeed, can I imagine that they would perform any useful office in that situation. I once succeeded in injecting a minute lymphatic plexus in the dermis of a fœtal lamb.

"The nerves of the dermis, after entering the areolæ of the deeper part of the corium, divide into minute fasciculi, and these quickly separate into primitive fibres. Corresponding with the horizontal vascular rete, the nervous fasciculi constitute a nervous rete, from which loops of primitive fibres enter the papillæ. In the less sensitive parts of the skin, the loops are simple, and more or less acute in their bend, in conformity with the figure of the papilla. In the sensitive parts, however, and especially in the tactile

papillæ of the pulps of the fingers, the loop is convoluted to a greater or less extent, and acts as a multiplier of sensation.

" The epidermis is a membrane of defence, spread out upon the surface of the dermis. As we have previously observed, this membrane presents a difference of density according as it is viewed from its outer or inner surface; the outer or free surface being dense and horny, the inner or attached surface being soft and cellular. Moreover, the epidermis is laminated in its structure, and the laminæ present a progressively increasing tenuity and density, as they advance from the inner to the outer surface. This difference in density and thickness is dependent on the mode of growth of the epidermis, for as the external surface is constantly subjected to destruction by attrition and chemical action, so the membrane is continually reproduced on its internal surface, new layers being successively formed upon the dermis to take the place of the old.

" From a review of the structure of the epidermis, it follows, that this membrane is accurately modelled on the papillary layer, that each papilla finds its appropriate sheath in the newly-formed epidermis or rete mucosum, and that each irregularity of surface of the former has its representative in the soft tissue of

the deep layers of the latter. It is not, however, the same with the external surface of the epidermis; this is modified by attrition and exposure to chemical and physical influence; the minute elevations, corresponding with the papillæ, are, as it were, polished down, and the surface is consequently rendered smooth and uniform. The palmar and plantar surfaces of the hands and feet are an exception to this rule, for in these situations, in consequence of the large size of the papillæ, and their peculiar arrangement in rows, ridges corresponding with the papillæ are strongly marked on the superficial surface of the epidermis. Moreover, upon the borders of the fingers, where the linear-disposed and magnified papillæ of the palmar surface gradually pass into the irregular and minute papillæ of the dorsal surface, a transition state of the epidermis may usually be observed.

" Besides the form bestowed upon the epidermis by its relation with the dermis, its degree of thickness will be found to be dependent upon the same source, and to bear an accurate proportion to the degree of development of the papillæ. Thus, on the palms of the hands, where the papillæ are large, the epidermis is thick; while on the backs of those organs, or on the scalp, where the papillæ are small, it is exceedingly thin.

"Another character presented by the epidermis is also to be considered as the consequence of its connexion with and dependence upon the dermis—namely, the network of linear furrows, which everywhere intersect each other, and trace out the surface into small polygonal and lozenge-shaped areæ. These lines correspond with the folds of the dermis produced by its movements, and are most numerous where those movements are the greatest, as in the flexures, and on the convexities of joints. Some difference is perceived in the form of the areæ, when examined in these two situations: thus in the flexures of the joints they are narrow and long, and, for the most part, lozenge-shaped in their figure, while on the convexities of joints, as upon the elbow and knee, the areæ are large, and more nearly quadrangular.

"The deeper tint of colour of the skin observable among the nations of the south, and in certain regions of the skin of the European, is due to the presence of pigment in the cells of the epidermis. The pigment cells are most abundant in the furrows of the dermis, and in the hollows between the papillæ, and in this situation, from pressure against each other, are irregularly polyhedral, and sometimes hexagonal in figure.

"The pigment consists of minute, flat, and oval-shaped granules, which are inclosed in greater or

smaller number in the epidermic cells. So long as the granules are surrounded by the fluid of those cells, they retain all their depth of tint, but when desiccation of the cells takes place, and the cells are converted into scales, the pigmentary granules dry up, and their colour is destroyed. It is for this reason that the deeper layers of the epidermis are always richest in pigment, while, in the superficial strata, the tint approaches to a whitish grey. The production of pigmentary granules is not limited to the horizontal stratum of the dermis, they are also met with in the various inflections of the epidermis, constituting sudoriparous and sebaceous glands, and hair-follicles. It is in consequence of the presence of pigmentary granules in these inflections that we are enabled to perceive the organs to which they belong with greater facility; and, for the same reason, we discover pigmentary granules in the perspiratory and sebaceous secretions.

"The chemical composition of the pigment of the skin may be inferred from the analysis of the pigmentum nigrum oculi made by Scherer.* The principal elementary substances composing this pigment were found in the following proportions:—

* Liebig, Organic Chemistry.

Carbon	58·273
Hydrogen	5·973
Nitrogen	13·768
Oxygen	21·986

"The identity of structure of the external tegument or skin, with the internal tegument or mucous membrane, has long been established. In both, the same parts are found, and each is continuous with the other. Mr. Bowman, of King's College, whose remarks, founded on careful and persevering observation, are always important and deserving of attention, again directs our notice* to this fact, and adduces another point of similitude between these membranes. He finds beneath the epithelium of mucous membranes, on the one hand, and in contact with the vessels of the parenchyma on the other, 'a simple, homogeneous expansion, transparent, colourless, and of extreme tenuity:' this delicate expansion serves as a foundation on which the epithelium rests, and in accordance with this view he terms it the '*basement membrane*.' This is, in fact, the boundary layer of all vascular membranes, and as such is met with in serous as well as in mucous structures. The extreme tenuity of the basement membrane may be inferred from the mea-

* Cyclopædia of Anatomy and Physiology; Article, Mucous Membrane.

surements instituted by Mr. Bowman; in the uriniferous tubuli its thickness does not exceed $\frac{1}{20000}$ of an inch; in the seminiferous tubuli it is $\frac{1}{10000}$ of an inch in thickness; in the lungs, it forms almost the entire thickness of the air-cells; and in no situation has it been found to exceed $\frac{1}{8000}$ of an inch. Reasoning from analogy, Mr. Bowman infers the existence of a corresponding membrane on the surface of the dermis, an inference that will be unreservedly accorded him; but he finds it difficult to demonstrate this membrane in the latter situation, in consequence of its close adherence to the vascular rete, and deeper seated strata. The same difficulty exists on the general surface of the mucous membranes, and for the same reason; but, in the minute tubuli of the secreting glands, the connexion between the basement membrane and the vascular rete is so slight, that they separate on the gentlest pressure. In like manner Mr. Bowman finds no difficulty in distinguishing this membrane in the tubuli of the sudoriparous and sebaceous glands. Mr. Bowman remarks, that it is the basement membrane which gives firmness and form to the minute tubuli of secreting glands."*

* "A Practical and Theoretical Treatise on the Diagnosis, Pathology, and Treatment of Diseases of the Skin, &c. By Erasmus Wilson."

II.

The diagnosis of fracture is best ascertained by the use of the stethoscope. The following is an extract from what has been published by M. Lisfranc, and translated into English by Mr. Alcock: —"The stethoscope applied over the place of fracture, on the slightest motion of the part, conveys a much more decided crepitus than is perceived by the naked ear, during the most extended movements of the part. In many cases, even the slight pressure of the ear on the stethoscope suffices to produce the crepitation—a circumstance of no small importance, as freeing the patient from the pain necessarily excited by the motion requisite in the manual examinations. The crepitus yielded by the more solid bones is sonorous, and resembles the sound produced by breaking a piece of wood across the knee: it is accompanied with a sensation of roughness unpleasant to the ear. The sound yielded by the spongy bones is duller, and resembles the effect of a rasp on wood; except that now and then this noise is broken by sounds of a clearer kind, like those afforded by the compacter bones, only not so loud. The sound from oblique fractures is stronger than from those which are transverse; but when one end of the fractured bone rides over the other, the sound is then obscured,

and in some cases may not be perceived without slight extension or counter-extension of the limb. If the fracture is comminuted, the sensation as of distinct portions of the bone is conveyed by the stethoscope. When fluids are effused around the fracture, a gurgling is combined with the crepitation, and which is compared to the sound produced by a shoe full of water." A dry crepitous rattle is produced by inflammation of the cellular structure, wherein the serum becomes suppressed, and the cells distended with air, which may be mistaken for the crepitus arising from fracture. It is much louder, and may be distinctly heard by the patient or bystander; it is heard by making gentle pressure with the fingers or end of the stethoscope over the injured part; it is most distinct on the third day, and decreases on the fifth; it is a sound apt to be mistaken for fracture of the fibula. We have a sound like this in the common subcutaneous emphysema, on pressing interruptedly with the hand on the affected part.

The treatment of fractures may be divided into mechanical and medical: the methods I have used in mechanical treatment are explained in the preceding pages. In the medical part of the treatment of fractures, two great principles must be followed, and they will apply to all local injuries of the extremities: first, tranquillity of the arterial and nervous systems;

secondly, complete quietude of the injured part. These principles lead to this object—viz., that the keeping of injured structures in their normal condition is most advisable for the action of restoration of the parts from the effects of contusion, laceration, or effusion. As local diseases become the source of constitutional derangement, so, on the other hand, local disease is often the result of a general disturbance of the system, and their reciprocal actions are produced through the medium of what has been called an universal sympathy. Dr. Armstrong used to say, when lecturing on local irritation, " the fever which would be developed had three stages: first, of depression; second, of excitement; third, of collapse. The great object in the management of this simple fever is to prevent the occurrence of inflammation. Inflammation, it must never be forgotten, may arise in the progress of simple fever, and thus it may be converted into common inflammatory fever; though, unquestionably, it often begins and terminates as common simple fever; that is to say, it is merely accompanied by general and local simple excitement; conditions which are fairly separable from inflammation." The changes in the generation of animal heat are effected by the energy of the vital powers only. The corium which covers the body, and the internal surface of the alimentary canal, contribute to regulate the temperature

of the body. The opinion respecting the action of the cutaneous vessels in exciting, moderating, and almost extinguishing our heat, is supported by the physiological and pathological fact, of some parts of the body being frequently of a higher or lower temperature than the rest of the system. It is certain that transpiration is increased by elevation, and absorption by depression of temperature. From these observations it will appear how necessary it is that after first placing the fractured limb in a proper position, we should attend to the animal heat, upon the regulation of which the success of the case much depends. Having restored the extremities to their natural temperature, by means of artificial heat through the medium of the stomach and skin, the next object is to attend to the force of the heart's action: here we must be guided by the health of the patient in reference to hereditary and common causes. When the fracture is simple, and the pulse full, from ten to sixteen ounces of blood taken from the arm, after reaction has taken place, acts as a powerful preventive of inflammation; at the same time it assists the action of medicine in unloading the alimentary canal, and exciting the glands and absorbents, so as to produce a healthy state of the excretions. Mr. Abernethy used to say, when speaking of the regulation of temperature in the application of cooling lotions, "do not take the law

into your own hands, and so diminish the temperature of parts as to kill them." It has been previously remarked, that the vitality of the skin and cellular structure is great, and matter forms there with rapidity. Now there is danger in the external application of cold during the suppurative stage; and it must be borne in mind that when there is a deficiency of blood, there is also a diminution in the heat, and *vice versâ*. This leads to the consideration of injuries to the other structures—the fibrous and muscular. The suspension of natural heat in the integuments would tend to excite and engorge the vessels pertaining to these structures: hence I consider it necessary in such cases to raise the standard of heat, and increase the action of the organs of perspiration. In local injuries, independent of fracture, it will be seen how important it is to pay attention to time in giving the limb rest, as well as to the method of subduing the inflammation, and if I might make one general observation it is this—cold applications are the most injurious that can be applied to the skin in cases of inflammation of the cartilaginous, fibrous, tendinous, or muscular structures. The importance of general and local bleeding appears very evident, with the precaution not to deprive the injured structure of its vital properties.

OBSERVATIONS ON THE TREATMENT OF FRACTURES.

It is now eight years* since I first advocated the necessity of attending to and keeping up the action and temperature of the cutaneous structures in inflammation, laceration, or contusion of the cartilaginous, ligamentous, tendinous, fibrous, and muscular structures of the body, and also since I denounced in those injuries the application of cold, and the diminution of power by means of local bleeding near the wounded part. Experience has fully attested the many advantages of hot stimulating applications; they have a decided pre-eminence over all others in lessening the sufferings of the patient; while, on the other hand, much time is gained in restoring the reparative action of the parts, notwithstanding that tumefaction, redness, and swelling of the cutaneous and subcutaneous structures generally proceed with great activity during the first four days, then gradually subside about the seventh or eighth day, leaving the deep-

* *Vide* "Medical Gazette," vol. xiv. p. 670.

seated structures comparatively free from pain either on motion or pressure; and the truth of this will appear evident in reflecting upon the well-known Hunterian law, that no two inflammations can exist with equal force in the same system, the one will mitigate the other. Next, we must consider the lowly organized state of these structures, which are only balanced or supported in their normal action or temperature by the power of the exhalent vessels of the skin. Did these lower structures contain but one drachm of blood more than in their normal condition, the result would be inflammation, which would require three months at least to effect a termination by resolution. It is a fact, that excitement of the arteries in the vicinity of an injury assists much in the restoration of a sanative action. Only diminish the power of the arteries and exhalents below the natural standard in such injuries, and you deprive the limb of the means of repairing the mischief, and too frequently bring on phlegmonous inflammation or sphacelus.

By this statement I do not mean to condemn the necessity of general depletion when the pulse is quick and hard; but I feel bold in asserting, that local bleeding by leeches, with the application of cold lotions, prevents the well-doing of such cases. The sole use, and

an important one, of the diffusible stimuli, is in cases of great weakness, where they are only required to support the system, while it cannot be supported by the ordinary durable stimuli; and after the excitement is so far restored that the ordinary supports are now sufficient, we should lay aside the extraordinary, the continuance of which would be hurtful, and manage the convalescent and restored state of health by the powers employed in health. When the diffusible stimuli are continued longer, they are equally as hurtful, and a cause of disease, as they are serviceable when disease requires their support; analogous to wine, they bring about the system, in a weakened state, so as to be sustained by its natural and ordinary supports; but analogous to it in another respect, when the strength of the system requires not their additional stimulus, they carry it up into indirect debility.

We must bear in mind the remarkable lowness of vitality in these structures. A cut or laceration of the tendinous or fibrous structures is attended with far less serious consequences than a false position that stretches them. If the erroneous systems of surgery that have appeared in the world could be reduced to any general point of agreement, it would be, that there is not a mode of evacuation or of impoverishing the

several parts of the vascular system of their respective fluids, that the brains of practitioners have not been tortured to contrive and employ, forgetting that life is a forced state, that animals every instant of time tend to decomposition and death. An English poet, from the Latin, has somewhere said—

> " Wine, warmth, and love, our vigour drain;
> Yet wine, warmth, love, our life sustain."

We are apt to mistake the seat of pain, believing it to be in the lower structures, when, in truth, it has its seat in the cutaneous structure. The following case will afford some demonstration of the principles I have endeavoured to establish:—

—— Meek, aged forty-five years, fell from a scaffold, twenty-five feet in height, and received a fracture of the left temporal bone, and a compound comminuted fracture of the tibia and fibula, one-third from the knee-joint, about two inches below the insertion of the ligamentum patellæ. The nature of the fracture of the leg, with the injury to the surrounding parts, would have induced me to suggest amputation, had not the cerebral symptoms—viz., insensibility, with arterial bleeding from the left ear, manifested a fatal tendency. The upper end of the fractured tibia was split and splintered at least one inch and a half. Having removed the rough fragments, I reduced the

fracture, and placed it on one of my suspension apparatus, as described in the twelfth volume of the "Medical Gazette." After general depletion and counter-irritation, the cerebral symptoms gradually resumed a healthy state, about the third week from the time of the accident. Until the eighth day, the leg appeared to be progressing rapidly, the ends remaining in apposition; but whether owing to the sacking of the bed giving way, or want of outer support to the thigh, the broken end of the upper part of the tibia projected, and sphacelus round the wound commenced. Despite of adjustment, the end still protruded, as if from spasm; I again took off a large portion of the bone, and placed the leg in the straight position, with a long outer splint extending half-way up the thigh, which had the effect of replacing the fracture. I then applied a hot poultice to the wound, which was continued until it healed; ordered a stimulating diet, with meat, &c.

The union by bone took place at the end of the seventh week, at which time the case was seen by two medical friends who happened to be at Crayford—viz., Mr. Tuckett, of the Dreadnought hospital ship, and Mr. Alinson, of Woolwich, who were not a little surprised to see the bone consolidated. The case is an example of the benefit of country air and good diet in

cases of compound fracture. At the end of the tenth week the patient was removed home, a distance of two miles: and here I observed the immense difficulty of restoring the lost muscular action. He has now been more than seven weeks endeavouring, by the use of friction and action, to regain the use of the limb. Although he can now support the weight of his body on the leg, he is unable to walk without the assistance of a crutch and stick. I have frequently had my patients, who have had the thigh fractured, walking without support at the end of the eighth week. When the muscles have been kept so long on the stretch, or in the passive state, there is much difficulty in persuading the patient to use all his energies in obtaining a restorative action of the muscles. I do not like to make any assertion without proof, but I cannot help thinking (and it is my intention to reduce it to practice when the next opportunity occurs) that galvanism, applied moderately, and with the foot or hand immersed in hot water, would be highly beneficial in restoring the use of the suspended power of a limb.

I beg leave to state my objection to the straight position in the treatment of fractures of the thigh and leg. From the commencement of my surgical life I have been in the habit of placing fractured limbs in such a position, that the fewest muscles are rendered

tense. In fractures of the thigh, notwithstanding the apparent simplicity and adaptability of Dessault's splint, I am practically convinced that the patient who is treated in such a manner loses much time during the convalescent stage. The bone may unite, the limb may be rendered straight by its application, but on a fair comparison with a proper double-inclined plane, rightly adjusted, the patient will suffer far less pain in getting the limb accommodated to that passive form than by the extended position. Two things, therefore, are gained—a shorter duration of pain, and many weeks of time in the restoration of the muscular action during the convalescent stage of a fracture.

The splint that I use in fractures of the upper third of the tibia, extends from the outer malleolus to the upper third of the os femoris, having a hinge-joint opposite the outer condyle of the latter bone.

FRACTURE OF THE FEMUR,

WITH SEPARATION OF THE EPIPHYSES.

Nov. 27, 1837. —— Stillwell, aged twelve years, a youth of delicate appearance, and fair complexion, was the subject of the following accident:—In consequence of the wheel of an unloaded timber carriage passing over the right thigh, the bone was separated at each epiphysis, and fractured obliquely through its middle. The limb presented an unusual extent of deformity, the knee lying on its fibular side. That the bone was broken, was evident on the most superficial view; but in what manner, and where fractured, was not so easily determined. On making gentle extension, the limb appeared straight and the fracture adjusted; but on placing it over a pillow, the knee fell again to the outer side, as if it moved on a pivot. I then passed my finger slowly and carefully from the condyles upwards along the bone. About an inch above the patella I detected a transverse separation, attended with a soft inaudible crepitus. Continuing my examination, I found the fracture in the middle of

the os femoris to be oblique. Still continuing the examination, I found another separation of the bone in a transverse direction, immediately under the great trochanter, which conveyed the same sensation as the one above the condyles. The epiphyses, as is well known, are merely connected to the shaft of the femur, at twelve years of age, by cartilage, but they are, nevertheless, with the aid of the periosteum, very firmly adherent, and a separation at this point is by no means frequent. It is here that the growth of the bone, in length, is effected, and consequently it is not until after the twentieth year that the inferior epiphysis is united by bone to the diaphysis. The ossifying centre of the great trochanter makes its appearance during the third or fourth year, and is not consolidated with the rest of the bone until the eighteenth year.

The limb was placed on a pillow upon a double-inclined plane, and kept steady by means of three splints, (page 12,) loosely connected with broad tape, which was tightened at the end of the seventh day. On the fourteenth day I found the union of the epiphyses so firm, that on removing the lateral support the limb maintained its position. On the twenty-first day I was satisfied that union of the fracture had taken place, but not such as would have

justified me in allowing the thigh to be unsupported. At the end of the fifth week I permitted the boy to use the limb gradually; and at the same time cautioned the parents of the great risk of the parts becoming again separated by another accident.

As it is in the dissecting-room only where we can prove our assertions, it is with some diffidence I have published the above case, knowing how easily statements may be made unaided by proof; therefore, with the sincere desire to relate facts, I have only described that which was evident to my senses. I am not aware that the separation of the epiphyses from an act of violence has ever been described in any English work on surgery. I feel fully convinced that I have in children overlooked such a fracture or separation; its nature at once shews how easy it is of replacement, and how much sooner a firm union takes place than when the bone is fractured.

As regards the process of ossific union, I firmly believe in the following statement of M. Dupuytren: "That when the two ends of the broken long bone are brought together, and maintained in *accurate* apposition, they become, in the first instance, united by a swelling, and subsequent ossification of the soft parts immediately surrounding the ends of the broken bone. This forms a kind of case for the fracture, by which

the broken ends are held together for a time; then the broken ends so held together unite, and become consolidated." Thus he distinguishes between the first or provisional union produced by the swelling and subsequent ossification of the surrounding soft parts, and the ultimate or definitive union by the agglutination of the two broken ends. The former he calls the "cal provisional," the latter the "cal défini."

"The first period from the occurrence of the fracture to the end of about the eighth day, the periosteum, the cellular substance, the muscles, and other soft parts immediately surrounding the broken bone, become swelled, and form a considerable tumour, which can be felt externally. The thickest part is opposite to the situation of the fracture, and it is gradually lost on the natural surface of the bone in both directions from the fracture. In the commencement, the tumour is somewhat red—that is, there is some determination of blood to it; towards the end of the eighth or tenth day this redness disappears, and the swelling, when examined internally, has a white appearance. In the early part of the time, there is, in fact, a mixture of coagulated and fluid blood; blood is effused from the vessels which are in the situation of the fracture, and it subsequently coagulates. At this period there is either a kind of viscid fluid

found between the ends of the bone, or there is something like a reddish granular substance between them, a sort of spongy substance, nothing osseous. From the tenth to the twentieth or twenty-fifth day, the swelling becomes less in size; it is considerably firmer in its structure. It begins to assume a fibrous or cartilaginous, or something of an osseous structure, and during the same time the medullary cavity goes through the same process; it likewise begins to assume an osseous or cartilaginous structure. During this period, the second period, the parts admit of motion—that is, the broken ends can be moved on each other, but there is no *crepitus*, (i. e., from the tenth to the twentieth or twenty-fifth day.) The third period extends from the twentieth or twenty-fifth to the fortieth, fiftieth, or sixtieth day, and in that third period the external swelling becomes ossified. The internal swelling of the medullary matter becomes ossified in like manner; and, in fact, the external and internal ossification become firm enough to allow the patient to employ the broken bone, yet the actual extremities of the fracture are not united, they still remain connected by the red spongy substance." Although the fracture is at this time sufficiently consolidated to enable the patient to use the limb, yet it is weak enough, from an act of violence, to become separated

again. " The fourth period extends from the fortieth, fiftieth, or sixtieth day to the fifth or sixth month, and in that time the external swelling becomes completely and firmly ossified; and when you then examine it externally, it seems as if the periosteum were continued over the swelling to the sound parts of the bone. It has assumed a strong ossific character; the medullary membrane is ossified also, and the ends of the bone, which have not been closely united, are found to be connected by bone, so that you only see the situation in which they have been previously separated, as a strait line, when the fracture is sawn through. In the fifth period, which extends from the fifth or sixth month to the twelfth month, the external provisional callus is entirely absorbed, and the union of the bone becomes so firm that the bone will break more easily in any other part than at the seat of fracture. The provisional callus having served its purpose, of keeping the broken ends of the bone together for a given period, is entirely removed; and that portion of callus produced by the medullary membrane is equally completely removed." This, then, is the course taken by nature in repairing the fractures of long bones, when the two ends are kept in proper apposition.

This, surely, must be an answer to the *no-splint*

treatment, though, generally speaking, it is better to let an error die away, which it invariably will do when tried by experience. Yet, on a review of the "days gone by," we cannot but be struck with surprise at the numerous theories and modes of practice recommended, adopted, and condemned, then lying dormant for a century or more, and again revived with all the ardour and impetuosity of an original idea—witness the treatment of curvature of the spine.

My case, in a measure, affords a reason why some fractures are united in a much shorter period of time than has been taught by surgeons of the present day; it will also assist in explaining why the *no-splint* treatment has enlisted some supporters, their cases having occurred in children. Those who have advanced the doctrine of treating fractures without splints, only reason from a negative premise, from which nothing can be inferred. They have opposed the universal by the particular. Much of the confusion, fallacy, and sophistry of reasoning, arises from these points not being sufficiently attended to, and distinctly and rigidly investigated.

In reflecting on the mechanical part of the treatment of fractures, it must be borne in mind that bones possess the property of solidity and a non-yielding, for the purpose of giving origin and insertion

to the muscular system, and forming levers, which are moved by the muscles in various directions. Now the muscular system is in a state of constant action, and dependent on the nerves of voluntary and reflex motion. The movement of the fractured portions must lacerate, irritate, and disturb the healthy process of ossific union; also undue compression on a tumefied part will produce inflammation and muscular irritation. My patient suffered from an oblique fracture—a kind of fracture the most frequent.

In the first volume of the "Edinburgh Medical Essays," published in 1747, Dr. Alexander Monro has a paper, wherein he has given, from the pen of Dr. Porterfield, some abstract mathematical calculations why long bones are generally fractured in an oblique direction: they are worth perusal. Dr. Porterfield's demonstration is as follows:—"The absolute force whereby bones resist being broken transversely, is the power of cohesion uniformly diffused over the whole cohering surface; and this power of cohesion is compounded of all the powers exerted in every point of that surface. But these powers resist in parallel directions (being all perpendicular to the transverse section of the bone) with velocities proportional to their distance from their centres of revolution, and therefore the strength of the bone, or total

resistance of all these powers, shall be as their sum multiplied into the velocity of their common centre of gravity—that is, as the area of the transverse section of the bone multiplied into the distance of its centre of gravity from the fulcrum or centre of revolution."

Since writing the above, I have referred to the "British and Foreign Medical Review," for the present month, (January, 1838,) wherein is an extract from a paper by M. Roux de Brignolle, from the fifty-fifth number of the "Medical Press," July 12, 1837, on the Separation of the Epiphyses. He records cases as having occurred in subjects up to the eighteenth year, therefore I am not right in my remark, as to my case being the only one recorded in an English work. In M. Roux's paper, he vindicates his claim to originality against M. Gueritin.

DISLOCATION OF THE HIP JOINT.

THE following is an account of the treatment of a case of dislocation of the os femoris, on the dorsum of the ilium, in corroboration of the utility of keeping up the action of the skin, in contusion and laceration of the ligamentous and muscular structures.

Sept. 29th, 1835, Mr. John A——, aged 22 years, a strong robust farmer, was thrown out of a cart, by which fall he dislocated the hip joint. After the reduction, he was placed in bed, and had the joint fomented with hot water at intervals; took a draught, composed of two drachms of sulphate of magnesia and half a grain of tartarized antimony, in mint water, every three hours, and was put upon gruel diet.

30th.—The hip is swollen, painful, and discoloured; pulse full and frequent; skin hot; tongue white; great thirst. Abstract fourteen ounces of blood from the arm, and continue the fomentations, draughts, and low diet. A mustard cataplasm to be applied on the hip, just over the trochanter major, for half an hour, night and morning.

Oct. 1st.—The pain much lessened; the tongue moist; pulse reduced and regular; bowels freely relieved. Continue the mustard poultices; omit the fomentations, take the draughts twice a day, and one tea-cupful of mutton broth in the middle of the day.

2nd.—Much improved; can flex the thigh a little. There is scarcely any pain on making pressure on the upper portion of the os femoris. Ordered an embrocation, to be used twice a day, [equal parts of liq. ammoniæ and lin. saponis,] to the region of the hip, and along the outer part of the thigh.

3rd.—Still better. Discontinue the mustard cataplasms, continue the embrocation, and omit the medicine. Increase the diet to four ounces of meat a day. Use gentle flexion and rotation of the limb in bed.

4th, 5th, and 6th.—Gradually increasing the flexion and rotation of the limb.

7th.—Ordered him to get out of bed, and bear the weight of the body on the injured leg.

8th.—Ordered him to walk three steps.

9th.—Increased the number of steps to twelve. Apply a flannel roller round the hips.

10th.—Increase the walking.

11th.—He walked down stairs.

12th.—Sat up the whole day, occasionally walking across the room. I now applied a broad belt round

the pelvis, which buckled in front, by means of three straps, and two others passed under each thigh, so as to prevent it rising over the spines of the ilium; since which time he has been daily gaining strength in the joint, and is now able to walk two or three miles with little or no inconvenience. Forty days only have elapsed since the accident.

DISLOCATION OF THE ELBOW JOINT.

June 15, 1836, Mrs. B——w, of middle stature, aged about 47 years, from George-street, Portman-square, was thrown out of a chaise, in the parish of Erith; in consequence of which, the ulna and radius of the right arm were dislocated outwards, so that both bones rested on the radial condyle of the humerus. After reducing the dislocation, which was attended with much difficulty, I ordered that the limb should be steamed and fomented with hot water for one hour; after which, a large hot bread-and-water poultice was applied to the joint. The patient was then removed to Charlton, (a distance of four miles,) went to bed, and took a table-spoonful of castor oil.

16th.—On examining the limb, there was much

tumefaction. Continue the fomentation and poultice. The oil has acted freely. Diet to be spare, avoiding animal food and stimulants.

17th.—Continue the same means.

18th.—The swelling had greatly subsided; the extravasation extended from the shoulder to the wrist. On *gentle* rotation and flexion, no pain was produced in the joint. Ordered that the arm should be rubbed twice a day with an embrocation, composed of liq. ammon. ʒij. and lin. saponis. ʒx.; and a flannel roller applied, with moderate pressure, from the wrist to the insertion of the deltoid muscle. Increase the diet.

22nd.—Much improved. No pain felt on making pressure over the region of the joint.

30th.—Able to use the arm, and carry it occasionally without the sling.

Mrs. B. returned to London, and became perfectly well, without any unfavourable symptom.

From the above statement it may be observed that no blood was lost, nor any cold application used. The treatment was simply keeping up the action of the exhalants and absorbents, so as to remove tumefaction and extravasation, without lessening the vital properties pertaining to the low organized textures, as it is the ligamentous and tendinous structures which are injured in all dislocations.

GUN-SHOT WOUND.

LOSS OF SEVEN INCHES OF RIB.

In reflecting on the nature and properties of serous membranes, it has often appeared to me that the large serous surfaces which envelop the vital organs are not merely intended as a tunic, or simply for the secretion of serum, but possess a protective influence. Bichat remarks, that a very important use of the serous membranes is to contribute to the independence of the vital powers and functions of different parts, by separating the respective organs.

The following case of gun-shot wound exemplifies the amazing extent of protection the pleura must have afforded to the right lung, amidst extensive inflammation, laceration, and ulceration of the cutaneous, sub-cutaneous, muscular, and ligamentous structures connected with the pleura costalis. It also further supports my practice of not reducing either the normal temperature or vitality of the superficial structures in inflammation of the tendinous or cartilaginous parts of the body.*

* *Vide* "Medical Gazette," vol. xiv., page 673.

August 19th, 1832.—Mr. John M., a stock-broker, by accident received the contents of a loaded gun, at four feet distance, on the seventh rib of the right side, about an inch from the sternum, the shot, clothes, &c., traversing the rib, and causing a compound comminuted fracture of the bone, and finally lodging under the integuments over the latissimus dorsi muscle, near the spine. I cut down on the part, and took out what appeared to be a very full charge of shot, with an inch and a half of the rib. He was bled from the arm to the extent of twenty ounces, and took hydr. chlor. gr. vj. immediately, with twenty-five drops of the tincture of opium. The opiate draught was repeated every four hours, and he had a large hot bread-and-water poultice applied to the side. In the evening, I found him much relieved, expressing great comfort from the warmth of the poultice. I enjoined a spare diet of gruel or barley-water; the feet to be kept warm by means of hot water.

20th.—Breathing short, and pain extending up the chest and toward the right axilla. Continue the opiates, poultice, and diet; repeat the calomel at bed-time.

21st.—The pain subsided. Ordered a cathartic draught every four hours. Continue the low diet and poultices.

22nd.—Another portion of the rib came away in the poultice. The bowels not having acted, I administered an enema, which afforded great relief. A cup of mutton broth allowed in the twenty-four hours.

25th.—Another portion of rib, with several shot-corns and pieces of clothing, came away at the posterior wound; the purulent discharge very copious. Ordered a milk diet, with strong beef-tea.

27th.—I removed another portion of the rib from the posterior wound, three inches and a half in length. The treatment by poultices was continued till Sept. 9th, during which time the discharge very much abated. Shot, pieces of cloth, and fragments of bone, kept coming away at intervals. A roller was applied, with dry lint dressings, so as to afford moderate support. On the 21st he returned home to Wapping, convalescent, although the wound remained open, and continued discharging slightly until the latter part of December, shot occasionally coming away. I consider he must have lost at least seven inches of the rib. The case terminated without any pectoral affection, the sounds of the chest becoming natural, and I am inclined to believe that there is no adhesion of the two surfaces of the pleura.

BONY TUMOUR IN THE MEATUS AUDITORIUS.

DEC. 9th, 1838.—Thomas Middleton, aged 45 years, applied to me in consequence of complete deafness with the right ear, which, on examination, I found to be caused by an osseous tumour growing from the upper and back part of the meatus auditorius, extending across and filling up the passage, so as to interrupt the ingress of sound. I broke off the tumour, which was attached to the meatus by means of a narrowed peduncle, with a strong pair of dissecting forceps. The patient compared the separation of the tumour to the firing of a large cannon close to the head. The hearing gradually became restored.

The annexed figure represents the tumour of its natural size, (*b*,) and magnified, (*a*,) in order to shew its sublobular appearance, and the form of its pedicle.

GRANULATING SURFACE

MEASURING SIX HUNDRED SQUARE INCHES.—RECOVERY.

In presenting the following case to the profession, I am desirous of ascertaining, from any authentic source, whether I am not warranted in believing it to be the largest sphacelated wound of the integuments recorded in the annals of surgery as having been successfully treated. I have not given it publicity with a view to describe any novel mode of treatment, but as an example of the amazing power of the system in effecting the restoration of lost structures. Owing to the protracted term of the cure, I am not able to state the daily or weekly condition of the patient; neither would this be interesting to the practitioner; my object, therefore, will be to generalize under its different stages.

Erith, Nov. 5th, 1835.—Edmund Clark, aged sixteen years and nine months, in consequence of the explosion of some fire-works, was burnt to the following extent:—From the upper and fore part of the neck, extending laterally down the left arm to the insertion

of the deltoid muscle; occupying both axillæ; passing backwards to within three inches of the spines of the vertebræ; over the chest, body, and genitals, to the verge of the anus; extending along the upper part of the right thigh, and down the left thigh to the knee, destroying the cuticle, rete mucosum, and corium. The whole measured above six hundred superficial inches, or four feet twenty-four inches, and averaged a quarter of an inch in depth. Also the sub-cutaneous structure was completely lost, so that the arteries and veins were seen, as if neatly dissected, lying on the surface of the muscles and fascia. In recording the treatment, it will be better to divide the case into six stages—namely, depression, reaction, exfoliation, ulceration, granulation, and cicatrization. During the whole of the treatment I adhered to three principles: first, a nutritive supply of food; secondly, a proper protection of the wound, in reference to the regulation of the animal heat; and, thirdly, the external and internal use of antiseptic agents.

The treatment during the stage of depression, which lasted the first forty-eight hours, consisted in bathing the edges of the destroyed parts with spiritus terebinthinæ, covering the whole of the trunk with flour, and enveloping the patient in a blanket, external to which stone bottles, filled with hot water, were placed

at the feet and sides of the patient, and replenished every three hours. He took thirty drops of the tincture of opium, in brandy and water, every six hours. His diet consisted of beef-tea, thickened with arrow-root. While this depression remained, the sensorium was in a comatose state; the pulse fluttering and rapid. The stage of reaction was, at the onset, attended with great irritability of the brain and violent action of the heart, the pulse ranging between 150 and 200. The stomach was so irritable as not to retain any liquid, until I administered an enema of beef-tea, highly salted, which acted very beneficially in quieting it. I now gave a drachm of the carbonate of soda, with a drachm of the sp. ammon. arom., according as the stomach could bear them, and applied yeast poultices to the wound where exfoliation had commenced. This stage continued four days. The process of exfoliation, which lasted about twenty-five days, was accompanied with a typhoid form of fever, and the effluvia from the sphacelus during this time were most offensive. The application of yeast and linseed-meal poultices was continued, with chalk and cinchona to the exfoliated parts; while the diet was altered to port wine, beef tea, &c., and oxymuriatic gas was evolved in the room every two or three hours. Injections of beef tea, mutton broth thickened with

oatmeal, were also administered every six hours. The stages of ulceration, granulation, and cicatrization, may be said to have commenced from the fourth day, and continued to the end of the case. As the typhoid symptoms abated, I ordered a milk diet, to which article I ascribe, in great measure, the circumstance of the system being able to support such an immense quantity of purulent discharge, the patient taking, on an average, six pints of milk in twenty-four hours. And here I must be allowed to remark on the advantage milk has over all other aliments, though, like every article of food, it requires discrimination in its use. I believe, in ninety-nine cases out of a hundred, whenever there is fever, the stomach will be found to contain an undue quantity of acid, and in such a state milk would be inadmissible, unless an alkali be taken with it. The wound was now dressed with chalk and cinchona, sprinkled or dredged on it, over which a plaster of spermaceti was laid, and this was covered with a thick layer of wadding or carded wool, and calico rollers applied, with graduated pressure, which was increased as the case progressed.

About three months from the time the accident occurred, the patient suffered from a sphacelated wound in the sacrum; and about four months from this time, the unfortunate youth became a sufferer

from an attack of bronchitis, attended with expectoration of blood. When the latter subsided, I entertained sanguine hopes of his ultimate restoration, as he kept improving, more or less, till April, 1837, when he was sufficiently recovered to walk a short distance. On the 23rd of this month, when apparently in health, he was seized with a fit of shivering, succeeded by erysipelatous inflammation, which increased the dimensions of the wound from forty-five inches to upwards of one hundred and fifty inches, and finally settling in the lowest extremity, destroyed the integuments of the upper part and sides of the foot. The poor fellow's death seemed now inevitable, and my expectations, from being raised to the highest point, became completely depressed. But with a steady adherence to the recumbent posture, the use of small doses of opium, nitric acid, &c., he was again, as it were, recalled to life, since which time the healing has gone on with great rapidity. He is now enabled to ride on horseback a distance of fifteen or sixteen miles in the day, and is free from all contraction, excepting a slight one in the left groin. The wound is reduced to less than twelve inches.

Six years have now elapsed since the publication of this case, at which time twelve inches of the wound still remained unhealed. It may be interesting to the

reader to know the termination and its results. It required three years to reduce the size to about an inch square, after which the wound continued in a passive state for the space of a year and a half. During the whole process there has (and the disposition still continues) been more or less tendency to congestion of the brain, attributable to the imperfect action of the cutaneous structures in regulating the action of the animal heat, as the skin, by its absorbing power, is enabled to act as an organ of respiration. The process of absorption in the skin is effected by an active endosmosis, which is controlled by vital influence as it reaches the strata of the epidermis most nearly in contact with the dermis. The symptoms of congestion were relieved by small general bleedings, occasional saline aperients, and a strict attention to diet, especially in reference to the use of stimulants, which never appeared to be indicated. Slight vertigo, with general lassitude, were frequently relieved by muscular action, by causing a reaction on the skin—perspiration always being a relief to the giddiness.

A question naturally arises, What could be the reason why the latter part of the healing action proceeded so slowly? I have attributed it to two causes—tension, and to the too-active state of the sudoriparous and sebaceous glands.

Mr. Erasmus Wilson, in his able work on "Diseases of the Skin," (page 5,) has the following excellent remarks on the mode of reproduction and growth of the epidermis. (In the present case the dermis was completely destroyed, so that the quotation will only explain the process which took place in the reparation of the skin, by altering the word dermis for cellular membrane, as the identity of structure of the external tegument or skin, with the internal mucous membrane, has long been established.) "A stratum of plastic lymph (liquor sanguinis) is exuded by the capillary vessels of the dermis upon the surface of the latter. This fluid lying in contact with every part of the surface of the papillary layer, and acting as a blastema, is, by virtue of the vital force inherent in itself, and communicated to it by contact with a living tissue, converted into granules, which are termed cell-germs, or cyto-blasts. By a process of endosmosis, the cyto-blasts imbibe a certain quantity of albuminous fluid, partly derived from the effused lymph, and partly from the living tissues; and as an effect of this endosmosis, the outermost layer of the cyto-blast is raised from its surface, in consequence of distention with the imbibed fluid. The cyto-blast has now become a cell, and the solid portion of the cyto-blast, which always remains adherent to the internal surface

of the cell-membrane, is the nucleus of the cell. Moreover, within the nucleus, one or several nuclei are formed, which are termed the nucleoli. The process of imbibition, which has been thus commenced, proceeds by degrees, until the cell has become nearly or entirely spherical. It follows, that, at this period, every part of the surface of the papillary layer of the dermis is covered by a thin and membranous stratum, formed of spherical cells, lying closely pressed together, and corresponding with every irregularity which the papillæ present. But as this production of cells is a function constantly in operation, a new layer is formed as soon as the first is completed, and the latter is separated by subsequent formations farther and farther from the surface of the papillary layer. With loss of contact with the dermis, the vital force is progressively diminished, and the cell becomes subjected to the influence of purely physical laws, and in consequence of the action of those laws, evaporation of its inclosed fluid slowly ensues. As an effect of this evaporation, the cell becomes gradually collapsed and flattened, so as to present an elliptical form, and the latter is by degrees converted into the flat cell, composed of two parallel and continuous layers, with an included nucleolated nucleus. By the increasing influence of the atmosphere, the flattened cell desiccates

into a thin horny scale, in which the nucleus is difficult to discover, and the scale itself is thrown off by a process of desquamation.

"From this description, it is apparent that the epidermis must be composed of a series of strata of nucleolo-nucleated cells, which exhibit a progressive stage of flattening, from the plastic fluid and cyto-blasts of the deepest layer, to the thin and horny scales with almost obliterated nuclei of the outermost layers. It is this peculiarity of disposition that enables us to split the epidermis into laminæ, and the deepest of these laminæ, composed of the soft and newly-formed cyto-blasts and cells, constitutes the so-called rete mucosum. In the deepest layer of the epidermis, the cyto-blasts are connected with each other by means of the unemployed portion of the plastic lymph, which constitutes an inter-cellular substance; but this medium is speedily lost, probably by endosmosis, in the formation of cells. The cells are connected only by their adherent parietes, and the flattened cells and scales by their surfaces and borders."

Another question might be asked, Did any part of the wound heal without attachment to the natural skin? It did; but not to remain permanently until the sides formed an attachment with the continuation of the healed skin.

In furtherance of the propriety and advantage of the milk diet, I am supported in my practice by M. Donné, who lately read a paper on this subject before the French Academy, in which he has established the existence of a striking analogy between milk and blood—an analogy not contradicted by experiments on animals. He says, "In each is found serum, containing, in solution, a specially azotized matter, coagulable spontaneously, and a great number of substances, representing all the materials for organization." In suspension are found concrete particles, called globules, which are of very complex structure in the blood, much more simple in milk.

Milk owes its whiteness and opacity to its globules of fatty matter, as blood owes its colour to the red particles. Milk may be said to be a sort of emulsion, in which is suspended fatty or buttery matter, in a state of extreme division. Filtering, so as to separate nearly all the fatty particles, deprives milk of its whiteness and opacity, leaving it a clear fluid, transparent, or only slightly opaline.

In pursuing the analogy between milk and blood, M. Donné has injected considerable portions of the former into the veins of animals: not only does this injection of a fluid, which cannot be called inert, produce no disturbance to the state of functions of

animals, excepting from some cause unknown in the horse, but its globules seem to perform the part of the chylous globules, being changed like them directly into blood globules. M. Donné relates the different experiments made by him on the nourishment of young animals by means of milk and soup; and having shewn the great difference to health from their respective use, infers that the consumption of milk is a subject of great hygienic interest, especially in populous cities, and inquires if it be possible "to increase the consumption, and amend the qualities of this valuable aliment, and thereby to render a signal benefit to public health."

RUPTURE OF THE RECTUS FEMORIS.

I HAVE known ruptures of the tendo Achillis, plantaris and palmaris longus muscles, without fracture, dislocation, or laceration of the surrounding parts; but until I saw the following case, I never had met with a rupture of the tendon of the rectus femoris muscle unattended with fracture, dislocation, or laceration of the adjacent parts; and if my memory serves me right, I do not think there is a case on record of the kind.

Mr. G. Shindler, a printer, a fine, stout, hale man,

was induced to join his son in walking to Woolwich, (1841,) a distance of five miles, to see the launch of her Majesty's ship, the "Trafalgar." In returning, both of them ran some distance, when, from a sudden trip of the foot, Mr. Shindler fell to the ground. He heard a loud snap just above the knee-pan, and nearly fainted from the excessive pain. With difficulty he was got up, and removed home, when he applied hot fomentations to the thigh, gave it rest, and thereby recovered from the severity of the injury. Six weeks afterwards he, for the first time, applied to me, stating that he had to walk to and from his shop, which caused great pain in the thigh; and he stated, in addition, that there was a very large swelling, which, on examination, I found to be the rectus femoris muscle, drawn one-third up the thigh, and with a corresponding depression above the patella. In these days, it might have been supposed that no one would be at a loss to restore the injury, hearing and seeing how tendons are divided with so much *sang froid*, and with such reported good success. In this I beg leave to say, that I do not call in question that great improvement in modern surgery, the cure of talipes by incision and extension, forming, as it does, one of the most efficient means in the cure of that kind of deformity.

It is generally believed, that the tendinous structures, after division, have a tendency to approximate; and the experiments of Gunther, Von Ammon, and Bouvier, on dogs and horses, have supported such a statement, shewing an intervening ligamentous substance, uniting the divided ends of a tendon. Now my patient's case is the reverse, and I am unable to effect any good by position or pressure. I informed Mr. S. that, as far as the injured muscle was concerned, the power was gone, but that it would be supplied from the two vasti muscles. Therefore, the only measure I adopted, was to endeavour to remove the tenderness by counter-irritation, and to restore the lost power by extension of the leg. By-the-bye, I have somewhere heard it said, when speaking of the cure of talipes, that it would be advisable to divide the tendon near to the fleshy or muscular part. Probably, in the above case, the rupture may be near to the muscular bands, but I am not able, by examination, to ascertain the exact part that is separated; I should, consequently, be slow to admit such a doctrine in the operation for talipes.

LARGE CALCULUS IN THE BLADDER OF A FEMALE CHILD,

THREE AND A HALF YEARS OLD.

In consequence of the shortness and dilatability of the meatus urinarius in the female, calculus is not so often found in that sex. In the female infant, indeed, it is a very rare disease, and although many cases are on record, yet I think none has been related as occurring in a female child under four years of age. Authors have differed more in respect to the treatment of the female than the male, especially in reference to the propriety of dilatation. Many judicious men regard the act of dilating the urethra, as tending to incontinence of urine, more than the operation of lithotomy.

The following case, occurring in a female child, three years and a half old, affords us an instance of the superiority of making an incision into the bladder, over the practice of dilating the urethra; indeed, it is an example of the impracticability of dilating the urethra in so young an infant. About a year and a half ago, the child, who was then two years old, was

brought to me, with swelling and inflammation of the nymphæ, and a mucous discharge. As, however, I had frequently seen these results from dentition, or irritation of the mucous membrane of the bowels, I merely requested them to give the child an aperient, and to keep the parts clean. In the course of two months from this time, the parents took her to another medical man, who treated the case as an affection of the spine. After being under his care about six weeks, the child was then taken to Greenwich Hospital, where the bladder was sounded, and a stone found. Owing to the age of the child at this time, and the extreme smallness of the vagina, it was deemed advisable to wait, which they did, until the child was three years old. Its sufferings were now intolerable; yet the digestive function maintained its healthy vigour. About this time I examined the bladder, and found the stone, which I attempted to extract, by dilating the urethra: failing in this point, I attempted to crush the stone, but owing to the mucous irritation of the bladder, which endangered the child's life, I was compelled to desist, and recommended the use of the alkalis. In the meanwhile, a friend of the parents urged them to remove the case to Guy's Hospital, where dilatation of the urethra was again tried for a fortnight. The parents, on

visiting the child, found her health so much impaired, that they brought her home, when I a third time saw the case, and found the same objection to extraction by dilatation as before. The sufferings of the little patient were now almost past endurance, her strength rapidly failing, never sleeping more than half an hour at a time, and death inevitable. As I could just pass my forefinger into the vagina, I determined on performing the operation of lithotomy, which was done on the 12th of January, 1842, with a small grooved director, blunt-pointed bistoury, and common forceps. I extracted a calculus of the lithic acid character, one inch and a quarter in length, seven-eighths of an inch in width, and two inches and a half in circumference, weighing two drachms and forty grains. The same night she slept four hours, and daily continued to improve, without a single unfavourable symptom, and, at the date of this paper, she retains her urine five hours at a time, the powers of the urethra and bladder fast resuming their healthy tone.

On reflecting on the character of the female urethra, the non-contractile power of the fibrous structure in a state of health, and the continued constitutional irritability which attends calculus, I cannot but think how possible it is (although a surgeon may succeed in extracting a calculus) to over dilate the urethra.

PART II.

MEDICINE.

THERAPEUTICS form, incontestably, the most important part of medical science; and if it may be truly said that certain preliminary acquisitions are indispensable to their perfect knowledge, it is equally true that in them is resolved all medicine, both practical and theoretical. As theory, medical science must always be studied with the intent of applying to the human frame the laws discovered, for it is from that very intent that medicine draws its definition, and it is for that that it has recourse to every other science. As practice, therapeutics embrace still more widely and more completely the whole domain of medicine; for by the patient's bedside they necessarily form the sole value of the practitioner, and, consequently, they must be looked upon as the most useful branch of the most

useful of sciences. And yet, unfortunately, how many phenomena escape us when we come to scan attentively the patient that lies before us, the disease under which he labours, the treatment that modifies it! How uncertain are the signs which might enable us to determine the peculiar dispositions of the sufferer! How often insidious symptoms deceive the conscientious investigation of an enlightened practitioner, in spite of the immense progress our modern medicine has made in diagnosis! And if to these so frequent causes of aberration we add all those incomplete and fallacious theories which the human mind, narrow and feeble as it is, is but too apt to embrace—on the one hand strangely neglectful of facts, on the other wantonly exaggerating them—we shall perceive how easily we sometimes may be led wide astray from the real constitution of a patient, the nature of his affection, and, consequently, from its appropriate treatment; and then, unless we admit that all these considerations are indifferent, that the intimate nature of all morbid affections is the same, and that all yield to the same agents, we shall be compelled to mourn over the illusions of the science, and the uncertainty of the art.

The observations of man, in the exercise of his divers functions, lead us to consider him as a being constantly acted upon by external influences, and himself

constantly reacting against those self-same influences with more or less energy. These external forces do not always act on him in the same manner: sometimes their modification is healthy, sometimes morbid; and then, in the latter case, new and abnormal functions, very different from those previously in power, are brought into action. Surely it is as important, as it is difficult, to learn the various modifications which those various causes, external and internal, stamp, as it were, on our various functions: but the question, already so complex, becomes far more so, when it is requisite positively to determine influences so deeply hidden, not only in the physiological, but also in the pathological body. How many ages must have worn away their labours, in this inextricable labyrinth, ere some lucid truths were elicited; how many experiments to each truth, and to each experiment how many verifiers: and yet, after all is said and written on this subject, we must each one of us come to bedside experience, if we are to be successful in our duties. Having said thus much, by way of exordium, on the subjects of medicine, I have chosen as my first article that which I deem of great magnitude, and pregnant with the most interesting facts, "The necessity of attending to the Premonitory Symptoms of Insanity."

ON THE IMPORTANCE OF ATTENDING TO THE PREMONITORY SYMPTOMS OF INSANITY.

I.

To judge by the many admirable productions of the most distinguished writers on the subject of insanity, it might be naturally supposed that few, or none, of the medical profession could be very deficient in a knowledge of that malady; and were the question proposed, perhaps no one would have the modesty to confess his ignorance of a disease which has, however, been the means of casting repeated and well-merited opprobrium upon the whole profession. "Every one knows how little value is attached to the evidence of medical men in cases of lunacy, on account of the wild and fanciful notions which they often bring into court with them. In common practice, if insanity declares itself, and resists bleeding, blistering, and purging, all the anxiety of the practitioner is to get the patient out of his hands, and to send him, no matter where, so that he sees no more of him; and we can ourselves testify, from personal observation,

that a nervous patient may be taken from the practitioner who has been in attendance, dragged, under the most unfavourable circumstances, before another, sentenced to confinement among lunatics, and placed beyond the possible means of immediate liberation."*

When we reflect upon the consequences of such ignorance, among a class of men whose office is directly associated with the worst personal, relative, and social evil that can afflict humanity, we may, indeed, be alarmed at the responsibility we each incur in our decisions upon and treatment of the insane. In such cases, it is not enough that a medical man do the best he can for his patient; he should be able to do the best that *can* be done, and in the majority of cases very much may be effected; not unfrequently, indeed, the patient may be delivered from impending insanity, by rightly comprehending its premonitory symptoms; and if we reflect that beyond their boundary is madness, when the wretched patient will be submitted to the slender chances of recovery in a lunatic asylum, how deeply anxious should we not be to rescue him from such an extremity.

To arrest the approach of death, and to reinstate

* See "The British and Foreign Medical Review," No. XIII., p. 3.

our patient within the circle of the living, demands no ordinary powers; but to wrestle with the premonitory warnings of madness, and to deliver the sufferer from the bondage of a living death, calls for the exercise of our highest faculties, and most extended means.

The duties of the general practitioner, in cases of insanity, are chiefly limited to the treatment of the premonitory symptoms; it is at that time when the patient stands, as it were, on neutral ground, that the practitioner is sent for; at a time when he is surrounded by relatives and friends, and the soothing attentions of home—circumstances often the most favourable for the sufferer.* But with these advantages, a very frequent cause of error in the judgment of a medical man, (when called upon to decide as to the state and probable restoration of the patient,) is the undue regard which is paid by him to the wishes and opinions of the friends, who seem to take a pleasure in enlarging upon the odd whims and irregularities of the patient; the fears of one party, and the ignorance of both, soon settle the question, and at

* "C'est souvent," says M. Esquirol, "dans le premier mois qu'un obtient le plus grand nombre de guérisons," an opinion which is confirmed by Pinel.

once precipitate the poor sufferer from a state of comparative sanity into irremediable madness. A medical man will do well to prefer even the immethodical relations of the patient, rather than trust to the opinions of friends, for how often is it that actions, seemingly the most whimsical, may be strictly consistent with the physical condition of the invalid; thus, insane persons, tormented with feverish heat, delight in exposing themselves to cold air or water, while, as M. Esquirol observes, a disordered state of the digestive organs often renders them (the insane) averse to taking food.

Avoiding all opinions that are prompted by the timidity or ignorance of the relatives, the practitioner will possess a most valuable agent in the advantages of home; but while he will necessarily avail himself of all the moral agents, the great evil is lest too much should be trusted to them. If the tongue be clean, the pulse regular, and the evacuations natural, the patient is too often comforted with a mild soothing remedy, and a few soothing words; he is encouraged not to foster whims and fancies; and thus the farce goes on, until it ends in permanent mental derangement. The result brings no reproach upon the practitioner; the very definition of the term *mental derangement* acquits him of ignorance or neglect.

We are little aware how much confusion arises from wrong definitions; and in no instance is this truth so forcibly exposed as in the ill-defined and misunderstood term—mental derangement. Sudden terror or protracted grief act upon the brain and nervous system, and end in madness; the brain responds to the mental action, and becoming deranged, reflects upon its agent the evil it has received; and thus mental derangement, though caused by the mental influence, is a subsequent effect of its own operations. If this definition were always kept in mind, any objection to the term would be impertinent; but the practice of regarding insanity as simply a disease of the mind, and which the state of the patient's general health will frequently corroborate, has led to the worst consequences in the treatment of the insane. Such a definition, with medical men, unless carefully explained, will be prejudicial to the success of their plans. It should never be forgotten, that what is true in psychology may be false in physics.

From pecuniary losses, or domestic disquietudes, a man becomes dejected, or irritable, abstracted, melancholy, nervous, or ultimately mad; the primary cause of his madness is justly said to be mental, but the effect is manifested by bodily disease, and if not always to be detected, yet not the less certain is it, as

M. Esquirol remarks, "that the chances of cure in insanity, but especially in melancholy, always offer more hope when we are able to perceive some disorder of the function of assimilative life."* The same is observed by the author of that very able article in No. XIII. of the British and Foreign Medical Review. "We grant that the mental malady may often be but the first sign of that total impairment of the frame which phthisis, or hydrothorax, or scorbutus, or paralysis, or marasmus, afterwards more plainly declare; but we suspect that there are cases in which, if the life of the patient were preserved through some of the maladies supervening on the mental disorder, the mind would be found to be restored, and the malady to be critical."† This opinion affords a most encouraging confidence in the possible cure of almost all cases of incipient lunacy, and could we but enlarge our faculties, so as to trace out the organic and functional changes in the various states of insanity, as in other diseases, there would be little to apprehend from its continuance. Happily for the patient, the time when he consults his physician is the time best adapted for medical aid; the patient is capable of describing his own feelings; he knows that something is wrong,

* Forbes, vol. i. p. 476.

† See p. 30.

and he often takes a melancholy pleasure in the relation of his minutest sensations. It is then that the medical attendant must be observant, acute, forbearing, and most anxiously solicitous, if he would save his patient, and with the nicest caution avoid every appearance of indifference, nor repress the anxieties of the sufferer by the assurance that he is nervous, fanciful, or whimsical.* Consistent with the preceding opinions, the materia medica will always furnish its aid to that of the moral agents. It is better that medicine should even create a disease, than resign its agency from an opinion that the case is altogether a mental alienation.

To allay the irritabilities of incipient insanity is certainly a desideratum in medicine; and we wish we could entertain the consolatory belief possessed by Sir W. Ellis, that "there is in nature some undiscovered medicine that would act as a specific in these cases." Whether such a catholicon may exist or not,

* "La conduite du médecin doit toujours être grave, la plus scrupuleuse justice doit caracteriser ses ordres. Jamais il ne doit plaisanter les malades sur les idées fausses qui les tourmentent: c'est un moyen sur de les exasperer.

"Jamais non plus il ne caressera leurs chimères, mais écoutant avec patience les plus minutieux details de leurs peines, il tachera de convaincre ces malheureux qu'ils sont malades, et que tous ses efforts ont pour but de les guérir."—*Foville.*

is indeed doubtful; but that remedies, correspondent to the nature of the disease, may be procured, there is no doubt. On being called upon to attend a case of incipient insanity, what is the plan to be pursued? This is the question which every one would naturally propose to himself, and which of course involves the issue of the case. The first consideration should be, that mental derangement implies bodily disease* in some form or other. With such premises the medical man must inevitably circumvent the whole case in all its relations, neither omitting nor trusting too much to the moral treatment, while he is on the alert to apply the most efficient medicines. The conduct and treatment of the medical man must be directed entirely by the cause, character, and violence of the malady; if a disease of excitation, or depression, or vivid hallucinations, or drowsy apathy—whatever be the state, the physical appearances will be sure to be coincident with the force and nature of the affection. The bodily organs soon yield to the mental suffering, and by their very derangement furnish the best possible suggestions to the physician, and in many cases the most effective antagonist to the disease. It is chiefly from this

* "Ainsi on peut établir que la plupart des causes de la folie agissent en excitant le cerveau."—*Foville.*

cause that the medical plan is more available in incipient than settled insanity. In the active and conscious struggle between reason and madness the health always suffers, but with absolute insanity the mind loses all its former recognitions; those previous anxieties and forebodings disappear with the mental consciousness, leaving the patient in that state of utter apathy, or frivolous activity, which is often most agreeable to the general health.* It becomes,

* Shakspeare, with his usual philosophical accuracy and profound observation, has strikingly illustrated this truth in the passionate reasoning of Constance:—

Pandulph.—Lady, you utter madness, and not sorrow.

Constance.—Thou art not holy to belie me so;
I am not mad: this hair I tear is mine;
My name is Constance; I was Geffrey's wife;
Young Arthur is my son, and he is lost;
I am not mad; I would to Heaven I were!
For then 'tis like I should forget myself.
Oh, if I could, what grief should I forget!
Preach some philosophy, to make me mad,
And thou shalt be canonized, cardinal;
For, being not mad, but sensible of grief,
My reasonable part produces reason—
How I may be delivered of these woes;
And teaches me to kill or hang myself:
If I were mad I should forget my son;
Or madly think a babe of clouts were he:
I am not mad: too well, too well I feel
The different plague of each calamity.

therefore, a matter of the highest importance to attend to those never-failing physical indications which characterize incipient mania; further than these first principles it would be useless to speculate upon the premonitory symptoms of insanity. "Quel est celui," says M. Esquirol, "qui pourrait se flatter d'avoir observé et de pouvoir décrire tous les symptômes de la manie même dans un seul individu?" Everything must be left to the occasion; and however intricate and obscure the disease may appear, much, if not all, may be effected by a steady and critical examination of the case, personal and relative. The following cases will, perhaps, better serve the object of this paper, than all that could be further said upon so involved and expansive a subject as the premonitory symptoms of insanity.

In describing the following cases, I feel some difficulty in stating the particulars of the treatment, as they are written from memory, with the assistance of but imperfect notes.

Case I.—Jan. 6th, 1832. I was consulted in the case of W. C. of Greenwich, employed in an oil and colour shop. In stature he was short; temperament melancholic; complained of great depression of mind, inability to rest, loss of affection for his wife and

children, which he appeared greatly to regret; and a sense of insufficiency to perform any act. His medical attendant, considering it the most advisable step to send him to a lunatic asylum, accordingly wrote, or offered to write, a certificate to that effect. His friends, not being satisfied with such an alternative, requested me to see him. I found great torpor of the liver, an intermittent form of fever, erysipelatous inflammation of the integuments covering the head, the vessels of the tunica conjunctiva injected with a yellow fluid, the urine copious and pale; the mouth sore with mercury, which tended only to render the paroxysms more distinct. On examining the chest, the sternum was much depressed; the action of the heart feeble; the region of the liver free from tenderness. In the epigastric region, the stomach was found unusually developed, extending down to the umbilical and left iliac regions. I ordered him a spare diet, with two drops of the hydrocyanic acid, three times a day, increasing the dose gradually, until he took fifteen drops in the day, which finally procured four good nights' sleep. His mind resumed its tranquillity, and he felt able to attend to his employment. The senses of hearing, smelling, and seeing, were natural; but the senses of tasting and feeling, unnatural. He continued im-

proving. Nov. 4th, 1832, his friends informed me that he had remained well, filling up his time with active exertion, and is, up to the date of this paper, enjoying good health.

Case II.—In relating the case of this patient, Mrs. F——r, it may be right to observe, first, that, previous to her marriage, in 1830, I attended her in consequence of an affection of the brain. She did not speak for seven months, during which time the circulation was not disturbed; there was functional derangement of the stomach and intestines, attended with great constipation of the bowels; the rectum appeared quite inactive, in spite of stimulating injections. She occasionally refused food, and fasted a most extraordinary length of time; the catamenia ceased, and, as it afterwards proved, from pregnancy; thence a cause of the hysterical mania. Since this time she has been the mother of three children, has conducted herself with great propriety under the most trying events of life, until January 23rd, 1837, when, from excessive grief for the loss of a child, a low type of fever came on, accompanied with great vitiation of the excretions, and loss of flesh. At this time she became pregnant, and appeared to rally, recovering her strength so as to enable her to take moderate exercise.

On the 5th of February, 1837, she was attacked with mania, attended with refusal of food, and loss of one or more of the faculties of the mind, without any perceptible disturbance of the sensations or voluntary motions. There appeared to be no one subject on which she might be excited. The paroxysms gradually became more and more severe. I gave large doses of tartarized antimony, and bled generally and locally, never exceeding ten ounces of blood at one time. The hair was cut short; cold and hot applications were tried to the head; blisters along the spinal column, dressed with strong mercurial ointment. For aperients, I first gave doses of six grains of calomel, with the sulphate of magnesia, which had no effect; the croton oil; also injections of hot water, containing salts, turpentine, castor oil, &c. By these means the bowels were relieved about once in forty-eight hours: the urine passed involuntarily. I next gave two drachms of the aromatic spirit of assa-fœtida, three times a day, which unloaded the bowels copiously; the bladder regained its tone; she increased in strength; her memory returned; and she took food by the mouth, having been previously fed with liquids through the nostrils, by means of a funnel, and injections of beef tea, &c., per anum. During this treatment, which lasted about five weeks, I kept the

husband and family away from her ; but on the 26th of March, finding her so much restored, and she having a desire to see her husband and children, I allowed it, with the hope of improving the better feelings of the mind. On the evening of the same day, to the end of seven days, she lost all memory, became most violent, using the most horribly obscene language, eating her food voraciously, again passing the urine involuntarily, and bowels not acting for five days, notwithstanding the daily use of injections. I repeated the assafœtida, which had the same beneficial results as before; her mind became more tranquillized, and on the 16th of August she gave birth to a fine healthy child. Three days after delivery reason once more returned, and my patient, up to the present time, has remained in perfect health of mind and body, and is anticipating the birth of her fifth child in September.

Case III.—Dec. 26th, 1837, I was sent for to visit a Mr. G. L——y, whom I found almost naked, in a state of excitement, labouring under great uneasiness, his ideas incoherent and incongruous, with unusual gestures, now and then bursting into a frantic state, exclaiming, "System! system! I want system!" On inquiry into the cause of this sudden fit of insanity,

I learned he had been in a very melancholy state of mind for two years, having previously imbibed the doctrine of the justifiability of suicide. The pulse was quick and hurried; tongue white and dry; skin hot; the eyes inflamed. I administered ten grains of tartarized antimony in his tea, which required to be repeated in two hours. After the second dose he became tranquil, but was evidently suffering from the most agonizing feelings of mind. He was now bled to the extent of sixteen ounces, and afterwards in small quantities, according to the hardness of the pulse; he also underwent a gentle course of mercury, taking the tartarized antimony, with small doses of sulphate of magnesia, according to the severity of the stages of excitement, which assumed an intermittent form. I forbade reading and conversation, but enjoined exercise of the body, especially gardening. In three months my patient became quite tranquil. I now requested him to go a voyage to sea, quit all his associates, and endeavour to forget the past, and contemplate the works of creation. This has happily proved of great service. I heard from him about two months ago; he was then off the Isle of France, in excellent health and spirits. It is just to observe, that when he left this place, as he felt the tendency to excitement, he took the ant. tart., with the sulphate of magnesia, until the feeling subsided.

On further inquiry, as to the moral cause of this condition of mind in a subject apparently so healthy, and descended from sound parents, I learned that he was placed as an apprentice, at the age of fourteen years, to a carpenter and joiner, at Rotherhithe, who frequently, in the presence of my patient, held conversation with another man on the justifiability of suicide. My patient then perused deep tragedy, making notes or comments on all those parts of the drama that referred to suicide. He also studied the science of music, and afterwards he had his mind excited by some lectures of Carlisle, Macconnel, &c., at the Rotunda, Blackfriar's Road, thereby living a life of undue excitement, which unfitted him for the duties which devolved on him in his station of life. Feelings of vexation and disappointment preyed on his mind; he sunk into a rooted distrust and hatred of mankind. It may also be interesting to add, that the individual who first sowed the seeds of the suicidal principle in the above case, himself committed self-destruction.

Case IV.—About the year 1830, I was asked by a medical friend to visit a patient, Mr. T——s, who had been under the care of two other medical men, who considered his case one of mania. I found the patient a tall spare man, of a melancholic temperament;

in conversation gloomy and distrustful, with a full power of memory. His skin dry; excretions clayey and very offensive; urine scanty and high coloured; fever of a remittent character, with typhoid tendency; pulse frequent and feeble; the senses of hearing and seeing natural; smelling, tasting, and feeling, depraved. The subject which had occupied his thoughts more than any other, was the hyper-Calvinistic sentiment, which he had imbibed with all the poison of bigotry. The difficulty of reconciling the unlawfulness of the act of living with another woman, his wife (whose character was not free from blemish) being alive, produced impressions in his mind, which so disturbed the other feelings, as to cause a profound state of despondency. I enjoined a light nutritive diet of animal food in solution, barley water, gruel, &c., every two hours, in small quantities, the maintenance of the recumbent posture, and the temperature of the feet to be attended to by means of a foot-bath; the internal exhibition of calomel, with small doses of tartarized antimony, every three hours, according to the state of the stomach and bowels, and friction to the abdominal region, with the unguentum antimonii tartarizati. In the course of seven or eight days, black offensive mucous discharges were passed from the bowels; the mind became more active; the

strength began to return; and the fever assumed more of an intermittent character. I now ordered the quina to be given between the paroxysms of fever, which afforded him much benefit; yet a considerable restlessness of mind remained, and although the health was so much improved, there was evidently an enlargement of the liver. At this stage I suggested his being removed to another place, it mattered not where, as a change of scene was necessary to give a turn to the moral feelings, and remove him from those surrounding objects which had been excitants in the commencement of his affliction. With this last injunction he did not comply; his health sank; he became a complete monomaniac, all hope in a future state being denied him. His pecuniary circumstances left no alternative but a lunatic asylum, to which he was taken, and in which he died within a few months of his admission.

Case V.—John ——, a printer, about forty-eight years of age, whose family had suffered from mania, was addicted to excessive and long-continued acts of intemperance. He possessed great mechanical power, and was considered a very superior workman; poverty was no incentive to duty; he would drink while money lasted or credit could be obtained; and to such an

extent were his acts of inebriety carried, that his family were compelled to seek parochial aid, which led to his removal to a lunatic asylum at Peckham, from whence he returned cured, after two months' confinement. He then continued well for about six months, working at his employment. Again he resorted to his old habit; and in one of the fits of excitement, (Feb. 15th, 1832,) he divided the trachea, anterior portion of the pharynx, and some branches of the thyroid arteries, with a razor. After tying the vessels, the head was brought down towards the chest, and I forbade his making any effort to swallow; on the third day, I tried to pass a long elastic gum tube into the œsophagus through the nostrils, but it escaped through the wound. He was sustained by means of injections of beef tea, gruel, &c., per anum, which supported life until the opening in the pharynx closed, which was effected by the 18th of March. The fluids could now be made to pass into the stomach, with the assistance of a pad of lint to the wound, so as to exclude the atmospheric air, and cause the glottis to act. On the first admission of food into the stomach, gastric irritation supervened, which was relieved in a few days by occasional doses of ten drops of laudanum and a drachm of carbonate of soda. He again became tranquil, in which state he remained about nine or ten

months; but at the expiration of this period he relapsed into his old habit. His wife, to prevent his being sent a second time to an asylum, suffered every privation, and actually died, owing to the weight of her cares. Even this melancholy event had only a temporary effect. He a second and third time attempted suicide; on the latter occasion by jumping into a well. During the interval of these paroxysms, I frequently pointed out to him the necessity of attending to the early symptoms of excitement, and he at last consented to allow me the power to act when I thought proper. Accordingly, I requested his family to give me early intimation when he commenced drinking, so that I might have him brought home, and watched by an able attendant. Since he has allowed me this power, I have, in the first twelve hours of the attacks, administered repeated doses of the tart. ant. cum sulph. mag., in doses of from six to ten grains of the antimony to two drachms of the sulphate, which always had the effect of quieting him, and allowing of future treatment, without any further need of control. The management of the case then consisted in giving him sodæ carbonas and spirit. ammon. aromaticus in large doses, with a bland nutritive diet. It must be remembered, that the mucous membrane of the intestines of such men is generally

in an irritable condition, and if pain or tenderness in the epigastric region, with a hardness of the pulse, came on, I have taken six to eight ounces of blood from the arm. By a continuance of this treatment my patient is now able to support his family, and has also by frugality made some reserve for declining life.

II.

In a former essay I endeavoured to set forth the importance of attending to the premonitory symptoms of insanity, and to awaken the attention of the profession to the neglected state of this subject, rendered still more imperative by the manifest ignorance betrayed in medical evidence relating to the phenomena of insanity. To render this inquiry as plain and useful as possible, I illustrated it with various cases, in which both the moral and physical causes and effects of mania were considered. It is the object of this paper to detail still more minutely the premonitory symptoms of insanity, and especially such as present themselves in the generality of mental diseases.

The moral effects which demand attention, may be classed under ten heads (and let me premise by asserting that all these moral effects may arise, *pro tempore*, without any fear of insanity; nevertheless, I feel

warranted in regarding them as worthy of attention in combination with the general history of a case):—

1. Undue suspicion,
2. Discontent,
3. Remorse,
4. Disaffection,
5. Revenge,
6. Indolence,
7. Excitement,
8. Unnatural activity in the pursuit of different objects,
9. Fearful apprehension,
10. Forgetfulness.

Not that I am intending to enter into any controversy on the merit or the demerit of phrenology, yet in this inquiry I feel it due to my own sense of justice, to advocate the right use of the system in the investigation of moral causes. Phrenology teaches—first, that the brain is the organ of the mind, and is concerned in every mental operation, whether of emotion or intellect; secondly, that the brain does not act as an unit, but consists of a plurality of organs, each serving for the manifestation of an individual faculty of the mind; thirdly, that the energy of function, or power of manifestation, is proportioned *cæteris*

paribus, to the size of the organ, or, in other words, that a large organ *will, all other conditions being equal*, enjoy a power of action proportioned to its size, and, consequently, manifest the corresponding faculty with greater energy than if it were small. Cuvier says, " L'anatomie comparée en offre une autre confirmation dans la proportion constante du volume de ces lobes avec le degré d'intelligence des animaux;" thus admitting the influence of size of the cerebral organs upon the power of manifesting the mental faculties as distinctly as Dr. Gall himself could assert it. But, to prevent any misrepresentation, let it be observed, that there is scarcely a phrenologist who does not utterly scout the notion of organic size being the only condition of functional energy. To demonstrate the evidence of organic size being, *cæteris paribus*, a measure of functional power, let any one look into the field of nature, and there examine the testimony of every anatomist and physiologist who treats of the relation between structure and function. The brain, in its functions, must be relatively studied in reference to the amount of muscular power in the body. Dr. Marshall Hall states, " That the cerebrum is, in its acts of volition, an exhauster of muscular irritability; that in muscles separated from their nervous connexion with the brain we have augmented

irritability." It is admitted that insanity begins in the slightest departures from healthy feeling, and may be traced through every variety of shade to forms of severity, in which it is evidently associated with an infirm, ill-judging, ill-reasoning, and perverted mind.

After examining the moral effects, the next step will be to ascertain the primary cause, which will be found in the deranged function or diseased action of one or more of the various organs of the body. To descend to minutiæ here, would only be a tedious repetition of those pathological symptoms well known to the reader. Yet it may be well just briefly to observe, that the skin must be noticed with regard to its functions as an absorbent, exhalent, and regulator of the animal heat; the muscles, as to their action, in reference to volition; the heart, in reference to action and power; the blood, as to its condition and composition; the assimilative organs, in reference to diet and muscular power of the stomach and large intestines; and the glandular system, in reference to the supply of nerves of organic life.

As far as I have prosecuted the diagnosis of the premonitory symptoms of insanity, I have invariably found the exciting cause to exist in the spinal excito-motory system, and to be transmitted by sympathy to the brain. The primary cause or causes come under

the appellation of depression, stimulation, and irritation.

The fever that generally attends the early stages of insanity is of the congestive character. Congestion of the venous system is a state produced by the operation of common depressants, and marked by a diminution of the animal heat on the surface of the body, a diminution of the heart's action, and by a disturbance in the function of this or that organ which is the seat of congestion. The pathological inquiry must also be continued: first, in reference to predisposition; secondly, to disorder or deranged function; and, thirdly, to diseased action.

The medical treatment called for in each case, in which the mental disorder depends chiefly or entirely on some disordered condition of the heart, the liver, the stomach, the intestines, the uterus, &c., must, of course, vary in each particular case, and be conducted on general principles. In exemplification of the treatment, it is my intention to publish those cases which may, in addition to the following, come under my observation.

Case I.—S——l M—— n consulted me March 31, 1840: he was about twenty-six years old, of a middle stature, in temperament sanguineous. He complained

of lowness of spirits, and inability to perform any of his usual duties; he lost all confidence in himself, and thought every one regarded him with distrust; his religious views became unsettled, and his confidence in the divine promises disturbed by the fears of his final perdition, which he thought must be his inevitable doom. He was a man of the strictest integrity, and esteemed as such by his employer, naturally of a lively and amiable temper, &c. He left his business, which was that of a clerk, in a notary's office, in London, in the month of November, 1839; he felt himself unwell, and consulted his medical adviser, who, considering that he had simple fever, made no restriction of diet or action; in a fortnight he resumed his employment, but the malady returned with increased severity; he a second time consulted his medical friend, who termed his case a nervous affection, and placed him under a tonic treatment of aromatics, camphor, &c., and wished him to leave the neighbourhood of London; before going away, he was advised to have the opinion of another medical man, who approved of the plan pursued, and also stated that it was necessary that he should leave town; he then went to the Island of Guernsey, and sank into a state of deep melancholy; he consulted a physician, who told him to take much exercise, and walk

about, but ordered no medicine, stating it to be useless. From thence he went to Jersey, where he suffered more depression of mind. After remaining some time in the latter place, without benefit, he returned home, and a third time consulted his family medical attendant, who advised him to take a voyage to New York, but ordered no medical treatment: having a great reluctance to this advice, he came into the country, to be under my direction. On examination, he stated his inability to rest, had occasional dimness of vision; taste depraved, hearing good, bowels inactive, urine pale, inability to expel the last drops, muscular action defective, skin dry, with occasional sensations of heat and cold, not general, but partial. On inquiring as to the original cause, I learned that he had been washing his feet in cold water at night just before going to bed.

Treatment.—I ordered him to have the feet put into a hot bath, at 100 degrees, composed of six tablespoonfuls of mustard, in two gallons of boiling water, for fifteen minutes, at bed-time; to use the flesh-brush to the skin in the morning; to remain quiet: the diet to consist of gruel for breakfast; mutton broth, or beef tea, with bread, for dinner; no tea; and a gruel or arrow-root meal at seven o'clock in the evening; to abstain from fermented liquor and solid meat; to take

twice a day Pil. Hydr. gr. v., and a draught, composed of Carbon. Sodæ, ʒj.; Spt. Ammoniæ Co. ʒj.; Pulv. Rhei, gr. vj.; Misturæ Camphoratæ, q. s.

April 2nd.—He stated he had slept the whole night, such a circumstance as had not occurred during his illness. I requested him to continue the measures as stated—to take walking exercise, so as not to cause fatigue. I scarcely need observe that the partial paralysis of the muscles of the perineum was owing to defect in the internal pudic nerve, which is supplied from the fasciculi of the fourth and fifth lumbar and three upper sacral nerves; this leads us to the exciting cause—namely, a deficiency in the supply of organic force to the large intestines, kidneys, and probably to the mesenteric glands, by the excito-motory system, and through the medium of this muscular deficiency, exhaustion of the power of the cerebrum.

4th.—The animal heat more equally diffused; continues to sleep well; appetite improving; feels less gloom of mind. Continue the medicine.

6th.—Improving; the evacuations becoming more healthy, and the skin inclined to perspiration towards the evening. Continue the medicine.

8th.—Still improving, especially as regards the mind, but feels great general debility; continue the

pills until gentle ptyalism is produced; increase the diet, an egg with the breakfast. This system was continued so as not to produce prostration of the animal powers, increasing the diet as the mental faculties became natural, enjoining moderate exercise and mental quietude, avoiding excitement, until—

May 14th.—The weakness now being confined to the back, over the region of the fourth and fifth lumbar and three upper sacral vertebræ, and legs, I requested him to use a cold shower-bath every morning, and resume his duties, which he has done, and is improving in strength up to the date of this paper, not having had a return of his melancholy feelings. The above case is an example of the good effect of the mercurial action combined with the alkali, (carbon: sodæ,) the former being an excitant and antiphlogistic, while the latter acts as an antiseptic.

July 7th.—I have heard that he is deriving immense advantage from the cold shower-bath as a tonic.

Case II.—William K——p, a printer and publican, applied to me in the year 1828: a stout, middle-sized, dark-complexioned man; he complained of pain and weight over the head, imperfect vision, loss of appetite, great debility, pulsatory sensation across the occiput, trembling of the hand, evidently from intem-

perance; his feelings were low and desponding; he wept on the slightest occasion; wished for solitude, and yet feared to be alone, suffering the most dreadful nervous irritability, or sunk in the deepest despondency. The treatment consisted in abstinence from fermented liquor, loss of about twelve ounces of blood, taken in a full stream from the arm, and repeated mercurial aperients, which had the effect of restoring him to health of body and mind.

From the above time, to Dec. 28th, 1839, I lost sight of him, when I was sent for in haste, he having attempted suicide, and divided a portion of the right parotid gland, and some arterial branches, of a moderate size, so as to bleed rather profusely. Since I saw him, he had very much increased in flesh, from indolence of habit, as he had been out of work for some time, in consequence of an irritable disposition rendering him obnoxious to his employer; he had again drank freely of both beer and spirits. The membrana conjunctiva was inflamed; the pulse 120, and tremulous; pain in the hepatic region; distension of the stomach and large intestines; uneasy sensation over the whole of the dorsal vertebræ; paralysis of the right side of the tongue; neuralgic pains down the side of the neck; urine scanty, high-coloured, depositing, after standing, a brownish sediment. After

dressing the wound, I ordered the patient to be kept on low diet, to remain in bed, and to take the following draught every four hours:—

℞
Magnesiæ Sulphatis, ʒ iij.
Antimonii Tartarizati, gr. i.
Inf. Sennæ, Comp. q. s.
M. Ft. Haust., ʒ iss.

Dec. 29th.—Had a restless night; very incoherent in his talk; pulse full. I took sixteen ounces of blood from the arm; ordered the aperient draught to be continued, with Pil. Hydr., gr. v., added to each dose.

30th.—Slept about two hours; bowels acting freely; the evacuations dark and very offensive; tongue white, edges uneven. Omit the Ant. Tart., and take a tea-cupful of beef tea in the day.

31st.—The pulse 90; more natural; the mind is becoming tranquillized; vision still imperfect; complains of a noise in the ears, with tenderness in the right side. I now determined on continuing the mercury until gentle ptyalism ensued, with a spare diet, perfect quietude of mind and body, forbidding all conversation. The state of mental stupefaction in which he was when he committed the act, was, after a few days, succeeded by feelings of the bitterest remorse and contrition; nothing could pacify his self-accusations for having attempted so horrible a deed,

until I explained to him that his crime was itself an almost involuntary act, depending upon his deranged health, and that it was his previous ill conduct and intemperance which had induced the attempt: he said, "he had not been well the last six or seven months past, frequently wandering he knew not where, until hunger or fatigue roused him to reflection; and at other times shunning the society of friends, and stupifying himself in the corner of some public-house tap-room, imagining that every one distrusted him, and regarded him as unworthy of their friendship." My reasoning with him in endeavouring to convince him that health of mind was dependent on health of body, seemed to inspire him with hope, and allowed of my furthering the medical treatment, which was continued by attention to the sanguiferous system and primæ viæ, by removing the inflammatory condition of the membranes of the brain by the mercurial and alterative treatment.

Feb. 14th, 1840.—I took my leave of him, after he had assured me how gratefully he felt for his restoration to health of mind and body.

MANAGEMENT OF LUNATICS.

I HAVE just been reading the report of the Middlesex magistrates, as published in *The Times*, 1840, and have been not a little surprised at the statements therein made in reference to the question of the restraint or non-restraint system in the management of lunacy. Apart from the prevention of mania, there can be no subject which demands more searching inquiry than the treatment of the insane; but I cannot help thinking that there is much ado about words instead of actions. It may please the fine feelings of sympathy to state to the world that in this or that asylum the non-restraint system is followed, but to the practical man it is all sheer nonsense: why send a poor creature away from the endearments of home, if such a mild plan of operation would be safe? The question is not whether patients shall be bound by iron, wood, or leather; but it is, how are patients who possess not the rational will, to be *made* to undergo a proper mode of treatment? It is a standard principle in the treatment of lunacy never to threaten

without performing; therefore, it is necessary to have power to act, and not to depend upon imperfect means. *Mechanical as well as medical treatment is necessary* in the treatment of mania. Suicide is not the crime to be dreaded in the violent maniac: it is the quiet hypochondriac who requires watching: he is generally artful and unsuspecting: distress is marked in his countenance, and he feels the indescribable pain of horror which in a moment impels him to the dreadful act; therefore mechanical restraint is not employed solely for the purpose of preventing self-destruction, but to prevent the patient, during a paroxysm of excitement, from injuring either himself or another, and also to enable the practitioner to administer medicaments so as to tranquillize the nervous system. It cannot be denied that cruelty has been inflicted on these poor people, for the purpose of saving labour and watching. It is no ordinary task to take the charge of a maniac; and if those who have advocated the self-styled non-restraint system have in any way been the means of increasing the number of attendants on the insane, they have conferred a great boon. It cannot be denied that in some cases it is almost impossible to keep the patient clean; and probably it is the injudicious mode of rendering a patient cleanly that constitutes one of the flagrant defects in the treatment of insanity.

There is another cause, which too frequently irritates the temper of the keeper, and that is, the resistance on the part of the patient to take food. I have known a patient resist both solids and fluids for five days, and then refuse, so as to render it necessary to compel him to take liquids by pouring them through a funnel down one of the nostrils. Humanity pleads for mildness in the treatment of the insane, but humanity never should interfere with duty.

I would again plead strongly for the necessity of preventing so direful a malady. Let the subject be but better understood by the profession; it would afford us no inconsiderable revenue, and greatly enhance the character of the medical man.

ON EPILEPSY.

THERE is no disease more complex than epilepsy, which I think is in no small degree attributable to want of system in its pathological description. Many cases have been reported illustrating its effects, but only a few have rightly described the various causes which produce it. By the present theory of the nervous system, we can the more readily understand the effects of epilepsy in reference to their many

causes; and without assuming too much, we can also discern the different effects, and trace them to their different sources. Pathologists, up to this time, have failed to ascertain the exact condition of the brain or spinal cord, which might probably be said to attend every case of epilepsy. M. Foville was forced, after the dissection of a great many brains and spinal cords, to avow that anatomy revealed neither the essential cause nor the constant effects of the disease. The Wenzels dissected a great number of cases of epilepsy, and invariably found a lesion of the cerebellum. Dr. Stokes has advanced a very excellent definition of the pathology of the nervous system, in his work. He says: "When we reflect on nervous phenomena, and consider how occult, how mysterious, the properties of those organs which give rise to them are, we are struck with astonishment at the discrepancy between cause and effect. No medical man has ever witnessed a case of confirmed tetanus or hydrophobia, without being impressed with a conviction of the imperfect and limited state of our knowledge of nervous diseases. It may be very possible, that in these neuroses the change, though so slight as to escape our means of detection, does absolutely occur; and yet such is the nature of nervous phenomena, that we must admit that great and extra-

ordinary effects are produced by very slight causes. Do we see anything like this in nature? any remarkable alteration in properties depending upon apparently slight causes? We do. We see extraordinary changes taking place in the characters of various inorganic substances, (to which I need not particularly allude,) and there is no reason why the same thing should not occur in organic structures. In considering the doctrine of Isomerism, I should be induced to think it throws some light on this obscure subject. In chemistry, it is a well-known, though singular law, that the properties of two bodies may be essentially different, at the same time that their respective component elements are, as far as our knowledge goes, identically the same; and the change, whatever it may be, appears to result, not from the abstraction or removal of any of the component atoms, but from their peculiar juxtaposition. Now, it being admitted in chemistry that many bodies having the same constitution possess totally different properties, and this difference being explained by the different position of their elements, it does not seem strange if the same thing should take place in the phenomena of organized beings; and if this be the case, we have a key towards the elucidation of the nature of these neuroses, and can conceive how an analogous change—a difference in the arrangement

of the molecules of the component parts of the nerves or their centres—may produce new modifications of their properties, without making any distinct change in their nature, or adding or abstracting a single molecule. I am much inclined to adopt the opinion of those who think that in the neuroses a peculiar organic change actually takes place, though we cannot demonstrate its existence; because to reason on the phenomena of life, independently of organization, is to plunge blindly into the hypotheses, and retrace the errors, of an antiquated and exploded school.

Were I to speculate on epilepsy, it would be in assigning it to a disturbance of the electrical or specific action of the nervous system, thereby causing an irregular supply of irritability to the muscular fibres of the body. Epilepsy must be regarded as an effect incidental to abnormal function, or diseased action of some portions of the brain or spinal column, and arising from many causes; therefore, for the sake of order—and it will be in accordance with structure—I propose dividing epilepsy into three kinds:—

First, Cerebral epilepsy.
Secondly, Spinal epilepsy.
Thirdly, Cerebro-spinal epilepsy.

The causes of cerebral epilepsy are as follow:—

1. Venous congestion.
2. Effusion of serum or blood.
3. Inflammation of the brain or its membranes.
4. Want of compactness in the bony compages of the skull.*
5. Atrophy of the brain.
6. Hypertrophy of the brain.
7. Induration of the brain.
8. Softening of the brain.

The causes of spinal epilepsy are as follow:—

1. Atrophy of the spinal cord.
2. Hypertrophy of the spinal cord.
3. Induration of the spinal cord.
4. Softening of the spinal cord.
5. Effusion of serum within the theca vertebralis.
6. Inflammation of the membranous portion of the spinal cord.
7. Dentition.
8. Offending matters in the stomach.
9. Intestinal irritation.
10. Hepatic, renal, and uterine deranged function or diseased action, and masturbation.
11. The contagion of measles, scarlet fever, small-pox, or of any epidemic.

* *Vide* "Medical Gazette," vol. xx. p. 910.

12. The imbibition of lead.*
13. The climacteric changes.

Cerebro-spinal epilepsy is only a more advanced stage of the two former, and is indicative of a fatal termination.

CASE OF EPILEPSY CAUSED BY ATROPHY OF THE SPINAL CORD.

July 7th, 1840, I was sent for to see a child of M—— C——, aged seven months, who was said to be suffering from teething, with hepatic and intestinal derangement. The child, from the age of six weeks, had been in the habit of having numerous doses of mercurials; and as to incisions of the gums, I know not how oft they were practised. He suffered from the effects of porrigo larvalis; and, from what I could learn, the child never used the lower extremities as other children do at his age. His intellect was of the best order, chest well formed, and he at times enjoyed the highest feeling of health and spirits. From the age of three months, the child had slight convulsive extension of the extremities, with pallidness of the

* *Vide* "Treatise on the Diseases occasioned by taking Lead, by L. Tanquerel des Planches, M.D.," under the head Encéphalopathie.

countenance, which, despite of various means, gradually increased, until confirmed epilepsy supervened. In one of these attacks, January 23rd, 1841, he died. On examining the body, the following appearances were observed:—On opening the spinal column, the theca was found adherent to the anterior portion of the canal throughout, but more so in its lower third. The theca was distended with serum from the sixth dorsal vertebra downwards. The pia mater was highly injected with red blood from the commencement to the termination of the cord. The spinal marrow was softer than natural, and in circumference only one half its natural size, with great diminution of size in the anterior and posterior spinal nerves at their exit. On opening the cranium, the dura mater was found healthy; the convolutions of the brain natural. On slicing the cerebrum, there were numerous exudations of red blood; the pia mater and tunica arachnoidea healthy; the right ventricle contained about three drachms of clear serum. The liver was enlarged, and covered with purple patches; above a pint and a half of straw-coloured serum was found in the peritoneum; the intestines healthy; the mesenteric glands enlarged.

CASE OF EPILEPSY CAUSED BY TAKING SMALL PORTIONS OF THE OXIDE OF LEAD IN WATER.

Mrs. C——r, aged forty years, presented the following symptoms:—A leaden, dull, biliary appearance of the countenance, pain over the hepatic region, extending to the middle portion of the sternum; imperfect vision; noise in the ears; disturbed sleep; indefinable general uneasiness; great fear; loss of memory; embarrassment and slowness of the mental faculties; pulse 90, small and hard; tongue of a buffy coated appearance; gums blue; skin inactive; urine small in quantity, and of a dark brown colour, depositing a brown lateritious sediment; the fæcal matter resembling that from a patient under the effects of jaundice. These symptoms gradually increased in despite of bleeding, mercurials, turpentine, counter-irritation, &c. Loss of flesh and partial paralysis supervened, until epilepsy came on, which I have no hesitation in declaring to be a fatal result, for although a patient may live for four or five weeks after the first epileptic attack, yet it will eventually terminate fatally.

On examination of the head, on the 16th April, 1836, I found the os frontis much thickened; the

dura mater adherent and inflamed; the convolutions of the brain shallow; the veins engorged; the cortical and cineritious portions of the brain tinged with spots of blood; the lateral and third ventricles of the brain filled with a transparent fluid, which extended into the spinal column; the tunica arachnoides healthy; the pia mater very much inflamed.

CEREBRAL AFFECTIONS FROM DEFICIENCY IN THE CRANIUM.

In the "Medical and Physical Journal," published in London, for October, 1821, a paper has been written by Sir Gilbert Blane, on the efficacy of mechanical compression in certain cases of hydrocephalus. He says, "In reflecting on the circumstances which characterize the history and description of hydrocephalus, —some of the chief of which are, that it is very seldom met with but in very early life, and most commonly in infancy, before the bregma is closed; that there is in most cases a preternatural size of the head; and that it is usually attended with a rachitic state of the bones, and a general scrofulous flaccidity of the soft parts, and runs in particular families,—it occurred to me that the distention of the head and bregma is

owing to a want of firmness and due resistance in the bony compages of the skull, which consequently yields to that effort of pressure with which the brain, in its growth, acts on its parietes. In reasoning further on the subject, it appeared to me conformable to some of the most approved principles of physiology, that, as there is a certain degree of tension and pressure necessary to the sound condition and action of parts, the withdrawing of this, by inviting afflux and congestion, produces serous effusion; and for the like reason there may be a deficiency of that interstitial absorption upon which the healthy state of this and all other parts of the living frame depends." Sir G. Blane relates one well-marked case, shewing the advantages of pressure. Probably the following surgical case, in which a large portion of the calvarium was deficient, may tend to support the above doctrine, as I could assign no other cause of death but the want of the bony support to the encephalon.

George Patterson, aged five years and three months, received a fracture of the upper and posterior part of the left side of the os frontis and anterior edge of the parietal adjoining, which exfoliated, leaving an aperture in the bony structure three inches by two inches in size. The wound healed; he remained well till the age of thirteen, after which he became subject to epi-

leptic fits, which returned at times, increasing in severity till the age of sixteen, when they put on every symptom of compression of the brain, till at last he would lie in a state of complete insensibility, with stertorous breathing, for seventy hours at a time. Treatment, consisting of general and local bleeding, mercurials, arsenic, antispasmodics, quinine, counter-irritation through the skin and stomach by means of ant. tart., all proved unavailing, till death terminated his sufferings, Oct. 17th, 1831, at the age of seventeen years.

Autopsy, ten hours after death.—On viewing the body, the only external defect was in the integuments of the back part of the scalp and ears, which were of a livid colour. On dissecting the integuments off the head, there was extravasation of blood, with the appearance of contusion on the back part of the skull, opposite the ridge of the occipital bone. On removing the calvarium, the dura mater adhered closely throughout, but was perfectly healthy; it was wanting over the original wound, the coverings of which were as follows — integument, tunica arachnoides, and pia mater. The sinuses were gorged with venous blood, also the veins leading to them presented an unusual size. The tunica arachnoides healthy; the convolutions of the hemispheres of the brain were flat-

tened; in the ventricles was found a small quantity of a sero-sanguineous fluid; the cortical and medullary substance of the cerebrum and cerebellum firm, without any infiltration. The thoracic and abdominal viscera presented every appearance of health. The mind, or intellectual constitution, was rather of a superior order than otherwise; memory strong. He was amiable in his disposition; fond of horse exercise and shooting; and very lively between the paroxysms, which interval sometimes lasted three months.

It might be asked, why was he not subject to epilepsy between the time of the accident and the commencement of the attacks, at thirteen years of age? On inquiry, I learned that from the time the wound healed over till he was thirteen, he wore a metallic plate, secured by a tight bandage, thereby making artificial pressure.

EFFECTS OF DEFICIENT OSSIFICATION OF THE CRANIUM.

THERE are two errors into which most writers are apt to fall—the one, of particularizing too much, the other, of generalizing too much, both tending to false consequences—a failing which I am desirous, in this instance, of avoiding, in my endeavour to shew that a defect of the bony structure of the cranium is, of itself, a cause of epilepsy, cerebral congestion, and hydrocephalus.

It may perhaps be well, in the introduction of the following cases, to consider for a moment the structure of the cranium; and, reversing the usual mode of reasoning, I shall commence from old age, and thence proceed to infancy. In advanced life, the bones of the skull are compact and very firm, almost uniform in their substance; hence, when old men receive a blow on the head, they suffer more readily from concussion of the brain, the different laminæ being so consolidated, as to admit of no yielding, nor do the

different layers of the bone prevent vibration. In middle age, the texture of the cranium is not uniform, the external table, or outer layer of bone, is tough and firm; the inner table, or vitreous, (as its name implies,) glassy, friable, easily broken: between these two tables we have the diplöe. These tables, or structures, being differently composed, and vibrating differently, are better calculated to resist the effects of a blow or fall, and can rarely vibrate together. In infancy, the skull possesses elasticity, such elasticity being greatest at birth, and decreasing as it grows. It is between the ages of nine and twenty months that I wish more particularly to notice the defect of compactness in the structure of the cranium. In a preceding essay, I endeavoured to support the truth of Sir Gilbert Blane's doctrine, of the necessity of compactness in the bony compages of the cranium to fit the cerebral mass for its natural action. Therefore, admitting that an unnatural separation of the sutures, and an unnatural enlargement of the fontanelles, with thinness of the bones of the head, is seen as an effect, the inquiry, of necessity, follows—What is the cause, or what are the causes, of such a condition; and to what results will this imperfection of structure tend?

In the first place, What are the causes? Improper

nutriment, a strumous diathesis, and a lack of warmth of the skin during the first seven or eight months of infantile life. What are the results of such a condition? Epilepsy, cerebral congestion, hydrocephalus, and mesenteric disease. Thus premising, I shall illustrate these remarks by relating a few cases.

CASE I.—EPILEPTIC FITS—OPEN SUTURES—ROLLER TO THE HEAD—RECOVERY.

January 12th, 1837.—I attended the child of G. P——ps, aged 14 months; he was subject to epileptic fits, which returned at intervals, day and night. Leeches, blisters, and calomel, were used according to the age and strength of the child; nevertheless, the fits returned with equal severity. On examining the head, I found the frontal bone advanced, with separation of the coronal suture; the anterior fontanelle enlarged. The child appeared to suffer from general lassitude, and pallidness of the skin, with considerable loss of flesh.

Feb. 7th.—He had a fit of epilepsy in the night. I now applied a calico roller to the head, about one inch and a half in width; ordered the child a milk diet, with six drachms of lime-water daily. The patient, from this date, steadily improved, without the slightest return of the fits, increasing in health

and strength. The circumference of the cranium was reduced an inch in extent.

May 1st.—Quite well, and has had no return up to the date of this paper. The parents have lost two children from hydrocephalus.

CASE II.—EPILEPTIC FITS—TEMPORARY IMPROVEMENT FROM APPLICATION OF ROLLER—DEATH.

Jan. 4th, 1837. — At Gravesend, W. Edwards, aged seven months, was attacked with epileptic fits, apparently arising from cerebral congestion, accompanied with symptoms of compression. He was judiciously treated by Messrs. Park and Armstrong, of the above place, with leeches, blisters, and calomel, under which plan he was, in a few days, restored apparently to health.

20th.—Returned home to Bexley Heath.

Feb. 25th.—The epileptic fits returned, but unattended by the same symptoms of compression of the brain. I applied leeches to the temples, counter-irritation along the upper part of the spine, and gave calomel, in three-grain doses, every four hours. The fits continued, with increased violence, until green fœtid motions passed off from the bowels, after which he again rapidly recovered.

March 10th.—He was a third time the subject of

epilepsy. I now directed my attention to the bony structure of the skull. The os frontis was much advanced, with separation of the coronal suture, and enlargement of the fontanelles, with general yielding of the bones. After he had passed a restless night, and had had two fits during that period, I applied a calico bandage round the head, so as to support the bony compages, and ordered, as in case the first, milk diet, and lime-water. In about a fortnight the head lessened, the bones receded, the epileptic fits did not return, and the child again appeared not only much relieved, but to all around not like the same child—lively, strong, and the countenance, from having a dull, heavy cast, became intelligent and expressive.

April 11th.—He had some slight epileptic attacks, which yielded to a few doses of calomel.

May 1st.—The epileptic fits returned, accompanied with irregular action of the diaphragm, so that, at times, the patient was nearly suffocated; the lips tumid, livid, ribs fixed, and the heart beating with tremendous force. From this time he lost the use of his legs. The spasms were relieved by opiates and mustard poultices to the region of the heart. These symptoms increased daily until June 6th, when he died, in full possession of his mental faculties, at the age of thirteen months.

Autopsy.—Twenty-four hours after death, on removing the integuments from the scalp, the occipito-frontalis tendon presented a dark, livid hue. The coronal and sagittal sutures not closed; anterior fontanelle very large; the cranial bones very thin. On taking off the calvarium, the dura mater appeared healthy. The hemispheres of the cerebrum engorged with blood, arterial and venous. The cerebrum soft, and spotted with blood on slicing. The lateral ventricles were found filled with a transparent fluid, extending through the third and fourth ventricles to the spinal column. Thorax and abdomen healthy.

CASE III.—RESTLESSNESS AND GENERAL INDISPOSITION—BANDAGE TO HEAD—RECOVERY.

April 3rd, 1837.—Mrs. W——d, from the neighbourhood of Cheapside, London, consulted me respecting her child, aged fifteen months. He had gradually lost flesh during the last five months, was unable to walk; was peevish, restless; appetite irregular. The evacuations from the bowels were green and slimy; the urine high-coloured, and frequently voided.

The child had been fed, as it is to be regretted many are, on tea, beef, beer, &c., and indulged with the breast at the same time, while the poor mother was

every morning nearly blind with exhaustion. The countenance of the child was animated and intelligent; the head large, and prominent over the eyebrows; the limbs small, body large, and spine weak. On examining the bones of the head, I found the coronal suture not closed, and the anterior fontanelle much enlarged. In this case I ordered an elastic belt to be made of the caoutchouc webbing, and applied round the head, passing it over the anterior portion of the frontal, over the upper edge of the temporal, round the ridge of the occipital bone; this was prevented from slipping, by a crucial strap over the top of the head. The child to be weaned, and to live on bread and milk, with one ounce of lime-water a day. In three weeks the child became healthy, slept well, and ran about; at the end of the sixth week the bandage was left off, the bones being closed and firm.

CASE IV.—OPPRESSED BREATHING—EMACIATION, ETC.

May 8th, 1837.—I attended the daughter of William D——n, aged fourteen months, and found her suffering from oppression of breathing; general emaciation; chill and heat, *without* perspiration, twice a day; pulse feeble, small, and quick; no appetite. The bowels passed off slimy, offensive motions; urine

pale, and small in quantity. The mother, who appeared exceedingly enfeebled, was allowing the child to suck, and, to use her own words, "until the last month past, the child ate and drank anything." The coronal suture I found not closed, but with serrated edges, demonstrating that it had been closed, but had become disunited, the frontal bone projecting. My attention was, of course, directed to the congested state of the lungs and febrile action, and its cause—namely, improper diet. I prescribed two leeches, and a blister to be applied to the chest, and a powder to be given the child, composed of Hydr. c. Creta, gr. ii., Pulv. Ipecac., gr. $\frac{1}{2}$, every three hours, and to assist in giving support to the bony compages of the cranium, an elastic belt to be applied round the head. On the second day the difficulty of breathing increased, with decrease of strength, and manifest evidence of serous effusion into the pleura. Early on the third morning the child died. I had no opportunity of making a post mortem examination.

PATHOLOGY OF HYDROCEPHALUS.

SEROUS membranes surround the vital organs, and are extra-vascular; and what are generally called arteries of the pleura, peritoneum, &c., are no more than vascular branches twining over their external surface, susceptible of being detached whenever these membranes are displaced, being connected with them, and not concerned in their structure, to which absorbents, capillaries, and cellular tissue, almost exclusively contribute. Undoubtedly there are communications between the arterial system and the serous membranes, through the capillaries, but nothing respecting the nature, the disposition, and even, in some degree, the functions of these vessels has yet been correctly ascertained. The vitality of serous membranes is very distinct from that of the adjacent parts; the sub-arachnoidean cellular tissue is the seat of an abundant serous secretion—the sub-arachnoidean fluid—which fills all the vacuities existing between the

arachnoid and pia mater, and distends the arachnoid of the spinal chord so completely, as to enable it to occupy the whole space included in the sheath of dura mater. Nerves have never yet been traced into the structure of serous membranes. Inflammation never destroys serous tissues. Inflammation acts by suppressing the serous fluid in the first period of inflammation. When the watery part of the blood transudes the capillaries, serum flows no longer from their free surface. It is during this stage that adhesions take place, the liquor sanguinis (plastic lymph, coagulable lymph, &c.) transudes, coagulates, deposits the fibrine which constitutes the adhesion, and is afterwards organized. If adhesions do not form, either on account of motion or from any other reason, and if the inflammation does not subside by resolution, then what happens in an open wound takes place on the serous surface; liquor sanguinis is also effused, and coagulates, and the lymph lying upon the surface which effused it, is converted by a nuclear change, analogous to that of the epidermis, into pus. Now this suppuration is never attended with ulceration and erosion of substance. Let their purulent collections be ever so considerable, these membranes will constantly remain uninjured; their tissue will be only more or less thickened; they emit pus in the same

way as their natural serous fluids—that is to say, by transudation. I also observe, that absorbents frequently terminate in the neighbouring veins. Veins absorb not as a specific action, but in virtue merely of their porosity or capillarity, and upon the principle that whenever two fluids of diverse nature are separated by an animal membrane, an admixture of the two takes place through the membrane.

The vessels are excited in the following degrees: the absorbents first, the lymphatic glands second, and the veins last. It is a fact, that exhalation forms tumours, and absorption removes them; and from M. Fodera's experiments, it is inferred that exhalation and absorption take place by transudation and imbibition, and depend on the capillarity of their tissues.

Three circumstances take place in the vessels of an inflamed part—two connected with the capillaries, and one with the large vessels: in the first change, the capillaries, which conveyed a colourless fluid, contain red blood; the second change consists in the increase of the diameter of the vessel; in the third change, the arteries and veins are alike over-distended. This appears explicable on two principles—increase of animal heat, and interruption in the circulation of the capillaries. This, as I have already said, shews a

direct tendency to produce suppression in the exhalants. In inflammation, the vessels, the blood, and the nerves, undergo a change. I do not say that inflammation does not take place in a neighbouring organ, as the brain, liver, &c., during effusion, but that inflammation cannot, and does not, directly cause effusion.

Health is the equipoise of all the functions. All the functions deduce their power from the nervous system; and, as a matter of course, if that system be unsound, the balance of functions will be disturbed; we shall have disease, inflammation—or if the inflammation be the consequence of heightened nervous energy, it will be more or less acute; if of diminished energy, low, irritable, chronic, &c. Thus nervous irritation is a probable cause of hydrocephalus, and anything that can occasion nervous irritation, be it lungs, or liver, or bowels, or anything else, may be the remote cause of hydrocephalus.

CONGENITAL HYDROCEPHALUS.

I WAS sent for by a midwife, Nov. 27th, 1841, at nine o'clock, A.M., to visit a Mrs. C——, who had been in labour about twelve hours. On examination of the case, I found the head rightly presented, and the os uteri nearly dilated, the pulse natural, and no unfavourable symptom; therefore I urged the necessity of patience, stating that I thought the case would terminate naturally in the course of the day. I again saw the patient about six o'clock, P.M.; found the head had somewhat descended into the last outlet of the pelvis, the pains not being very strong; consequently I left her in the care of the midwife, who is a very discreet woman, at the same time stating my readiness to attend if needful. On the following morning, at five o'clock, I was again summoned, and was informed that the pains had been very severe since two o'clock; the head I found in the same situation as when I left her on the preceding evening: her

pulse 120, and feeble. I therefore determined on immediate delivery with the forceps. Having introduced a short pair, I found I could not completely compress the handles; made extension, but the forceps slipped. I used them a second time, with similar results. I next applied the long forceps; they also slipped off the head. Finding it impossible by these means to deliver the woman, I resolved on perforating the cranium. Immediately after introducing the perforator, which passed very easily, at least two quarts of fluid escaped, of a sero-sanguinolent character. With the application of the short forceps, the fœtus was born, and, to my astonishment, lived about fifteen minutes, occasionally crying. The head shewed the remains of an enormous sac, the bones being widely separated, with not more than two ounces of brain in the cavity of the skull.

The above is a simple detail of facts. The singularity of the case consists in the immense quantity of fluid generated in the fœtal cranium during gestation, also the possibility of life being preserved after perforation of the skull; shewing the propriety of using the common forceps instead of the craniotomy forceps after the perforation, as it might not be impossible to save the life of the child after perforation of its skull.

There are not wanting instances to prove that the substance of the brain in children will bear much violence without destruction of life. I well remember, during the last year of my residence with Mr. Cook, of Gainsborough, being called to see a case of compound fracture of the skull of a child seven years of age, whose injury was caused by a kick from a horse, when I removed a lacerated portion of the left hemisphere of the cerebrum, about one inch square, with some fragments of bone. The child did well, without a single unfavourable symptom, and was running about in health within a month from the occurrence of the accident.

ON GALVANISM.

I.

IN REFERENCE TO ITS THERAPEUTIC EFFECTS IN PARALYTIC AND PAINFUL NERVOUS AFFECTIONS.

THE following cases have come under my observation, shewing the effects of galvanism, muscular action, or gymnastic exercise, in some painful affections of the nerves and irritable conditions of the muscles.

In prefacing those cases which relate to block-printers, it may be well to state briefly the nature of their employment. It consists in standing between a table spread with cloth, and a tub of colour, with a wooden sieve floating on its surface, placed about the height of the table. The man with his right hand grasps the upper part of a square block of wood with the thumb and middle finger, by means of two holes, made four inches apart. The under surface of the block has the figure of a pattern on it. These blocks sometimes exceed fourteen inches square. The man has to dip the block into the sieve in such a

manner that the surface be equally charged with the colouring matter. Resting on his right leg, he leans towards the table, and after placing the block on the cloth, the colour is conveyed into it by means of two or three knocks with a mallet held in the left hand. From the foregoing statement, it will appear that the muscles of the right arm, hand, and leg, are more constantly put into the action of extension and contraction than those of the left arm and leg.

CASE I.—PARTIAL LOSS OF POWER IN THE RIGHT HAND AND FORE-ARM, CURED CHIEFLY BY EXERCISE.

Robert W——, block-printer, aged thirty-nine years, of middle stature and sanguine temperament, complained of inability to dip the block into the sieve. When brought within two inches of the sieve, it fell from his hand. On examining the right radial pulse, I found it slower than the left; the animal heat was also less on that side. Depression of spirits; tongue coated with a white fur; torpor of the bowels; urine scanty and high-coloured, rather offensive. He was relieved by alkaline and aromatic aperients, and the use of the warm bath. This attack occurred in April, 1835. On the 15th of July, 1836, he again complained of the same inability in the right hand and

arm, with similar functional derangement. In both instances, he had been working over-time in the day, thereby causing fatigue. On this occasion he complained of dull pain along the distribution of the median nerve. The treatment was the same as before, with this addition—that he was directed to swing, with the right hand, a weight of several pounds, and to take much walking exercise. After a continuation of this plan for five weeks, he was completely restored, and resumed his employment, feeling stronger in the arm than after the first attack.

CASE II.—PARTIAL PARALYSIS OF RIGHT FORE-ARM CURED BY EXERCISE AND GALVANISM.

William C——, block-printer, aged fifty-two years, fair complexion, middle stature, nervous temperament, complained of acute pain in the course of the median nerve, with loss of power in the pronation of the hand and extension of the arm, also an inability to dip the block into the sieve. As regarded the digestive functions, there was very little derangement, only slight acidity of the stomach, and tendency to relaxation of the bowels. In this case, I tried the effects of aperients, stimulating embrocations, warm baths, rest, change of scene, &c., but without any

beneficial results; he was still unable to follow his employment. As in Case 1, there was irregular action in the arteries of the arm, with loss of organic sensibility in the right arm. Finding the above measures ineffective, I determined to apply the galvanic influence to the right arm, and to excite general action of the muscles. This plan I commenced early in July, with a battery of forty single plates, three inches square, each pair connected at the upper part with copper-wire, resembling Dr. Wollaston's battery, the Couronnes des Tasses arrangement. The shocks were passed in various directions, from the acromion to the carpus, every morning; a flannel roller was then applied from the wrist to the shoulder, and during the day he was ordered frequently to swing a six or seven pound weight in the right hand. This treatment was continued five or six weeks, when the hand and arm were restored to their former usefulness. During the action of the galvanism, the animal heat and sensibility increased daily, until he could hardly bear the shocks—a result which I consider to be the effect of restored power in the nerve. It may be just to observe, that these affections in printers have been deemed incurable.

CASE III.—OBSTINATE TIC DOULOUREUX, CURED BY GALVANISM.

James Finch, aged forty-seven years, by trade a tailor, middle stature, dark complexion, spare habit, not given to any excess, a married man, with a family, was, in the summer of 1829, attacked with symptoms of tic douloureux, the right trifacial nerve being the one affected, attended with involuntary contraction of the temporal, pterygoid, buccinator, and levator anguli oris muscles. These paroxysms returned at intervals with increasing severity, sometimes lasting fourteen days without intermission. In the spring of 1835, after having removed every decayed tooth on the right side, I put him under a course of mercury, which salivated him freely. This appeared to be attended with great benefit, and he enjoyed an interval of three months' relief from pain. It again returned, however, and I then gave him arsenical drops, until a garlic taste was experienced in the throat, but without any benefit. We next tried a vegetable diet, which he considered of service to him; after which he took iodine, and then drastic aperients (croton oil), but without any good effect. The carbonate of iron, in large doses, was next administered,

which relieved him for nearly three months. The paroxysms of pain returned again with horrid severity. On examining the remaining teeth, I observed that the second molar had a slight discoloration near the neck, but without pain; it was removed, and the paroxysms of pain gradually subsided the second day afterwards. Once more he remained well for thirteen or fourteen weeks, when another attack came on. I then gave him the carbonate of iron, at the same time applying galvanism to the head, face, and neck, by means of a battery of twenty-four pairs of plates, six inches square, put together after the manner of Cruikshanks. This plan I adopted for two months, and again he appeared to be cured. Nevertheless, the pain returned with, if possible, greater violence than ever. I next proposed his walking from fifteen to twenty miles daily. This plan used to relieve him during the exercise, but immediately after he sat down slight pains came on. In the beginning of July, 1836, he suffered to such an extent, that (to use his own expression) "death would be preferable to life." I then tried the galvanic battery of forty single plates, which I had constructed after the manner of Dr. Wollaston's, described in the second case. Shocks were passed from the back of the head, both sides of the face, down the neck, in the direction of every

principal nerve, but more generally from the region of the parotid gland, to the exit of the inferior maxillary nerve near the chin. The shocks from this battery were very severe, so powerful, indeed, that few could have borne them. Where the shilling which communicated with the wire touched the skin, it caused excoriation of the cuticle, till at last the pain of the shocks exceeded in severity the pain of the tic douloureux, especially over the region of the parotid gland. During this process, he took carbonate of soda twice a day, in two-drachm doses.

Sept. 12th, 1836, he felt better than he ever had done, since which time he has remained well, being enabled to wash his face with cold water, which he had not done before for three years.

The above cases are examples of the theory, that the action of the nerve is necessary to determine the action of the muscle, and that loss or impaired action of either nerve or muscle is generally productive of painful nervous sensations. Irritability is bestowed on all muscular parts, but in different degrees. The nerves exert their influence on the muscles, as remote and exciting causes of their action, but by no means as the proximate cause, which is the inherent irritability of the muscle. In Dr. W. Philip's paper, published

in the Medical Gazette for the 18th of March, referring to muscular action, he observes, "The healthy action of which is not a state of uniform contraction, but of a constant and generally rapid succession of contractions and relaxations; and, again, the permanent contraction is always a state of disease. It is followed, unless of very temporary duration, by a sensible exhaustion of excitability." And, from the experiments of the same writer, the accuracy of Haller's opinion is demonstrated—that the power of the muscular fibre is not derived from the nervous system, but resides in the fibre itself. The second and third cases confirm the assertion of Aldini, the nephew of Galvani, that a proper animal electricity is inherent in the body, which does not require any external agent for its development; and from the experiments of many authors, (Sir B. Brodie, Dr. Philip, &c.,) it appears that the galvanic energy is capable of supplying the place of nervous influence.

In the first and second cases, the muscles were extended by their antagonists, consequently those organs were left in a passive state, being momentarily deserted by their contractility, or, rather, they possessed it in a less active condition.

In Bichât's work on general anatomy, where it relates to sympathies in muscular structures, he observes,

"I am conscious there are very acute pains unattended with sympathetic convulsive motions; but convulsive motions of this nature are seldom observed without the organ, which is the source of sympathy, being considerably affected, and the focus of animal sensibility."

In conclusion, I would revert to the fact, that few changes take place in the fibrous structure of the muscles, considering how variously they are affected —none, I believe, except density, cohesion, and hue. The muscular system very rarely suppurates, inflammation generally terminating by resolution.

II.

THERAPEUTIC EFFECTS OF GALVANISM ON THE HUMAN SUBJECT.

I SHALL not recapitulate the numerous writers who have devoted their attention to the effects of galvanism, but take a retrospective view of the practical results of the chief experiments which have been performed. Many of these have been tried, under an idea that the muscular system might be acted upon independently of the nerves. Vasali, Julis, and Rossi, made a great number of trials on decapitated individuals at Turin. Volta and Aldini asserted that the muscular system

without the nerves could not be affected, while Fowler has made a contrary statement. In consequence of this uncertainty, many at the present day have failed to produce any beneficial results from the application of galvanism. Ritter has made some remarks on the different effects of the positive and negative wires, stating that the positive pole augments the functions of life, while the negative diminishes them—a statement, I think, not borne out by practice; and my belief is, that the notion of assigning a sedative quality to the direct effect of electricity is not correct; not but that a sedative effect may be the ulterior result of an over-stimulant action on the system. As regards the effects of galvanism on the functions of secretion, Dr. W. Philip has made very satisfactory experiments, so as to set at rest that part of the question, by proving an analogous effect between galvanism and the nerves of organic life. In the "British and Foreign Quarterly Review," for October last, are some interesting microscopic experiments, by Dr. Purkinje and Pappenheim, of Breslaw. They have demonstrated a set of mucous glands, which give out the active principle of digestion, or the gastric juice, and also that these glands give out sufficient chloride of sodium for the digestion of coagulated albumen. They have proved that if the nervous action in the stomach is

either identical with or analogous to galvanism, it would be sufficient to account for the secretion of the quantity of muriatic acid requisite for digestion, without the assumption of a special organ of secretion. Dr. W. Philip has related some excellent cases of dyspepsia, where he fully shews the great advantage of galvanism. He states its application to be, to assist the nerves of organic life, and not the nerves of volition. In his work on Indigestion, he has published a letter from Mr. Earle, giving a history of some trials of galvanism, which were satisfactory in three cases, at St. Bartholomew's Hospital. Breschet has also added to the stock of information in this department.* Thus far has galvanism been applied as a therapeutic agent, with the exception of two cases, published by myself in the twentieth volume of the Medical Gazette, page 70: one, a case of partial paralysis of the arm; the other, a case of tic douloureux, with some comments, which assist in sup-

* In the fifth number of the Guy's Hospital Reports, Dr. Addison relates seven cases of chorea, where a well-directed attention to electricity proved of great service. Dr. A. confesses that he formerly attached as little value to electricity as a remedial agent, as is ascribed to it by the profession in general, being "led greatly to underrate its efficacy in consequence of its vague and indiscriminate recommendation, or from the inefficient and careless manner in which it had been applied."

porting the following remarks. These several deductions are the result of my experience:—

1st. Galvanism is identical with the vital action of the nerves of organic life, and the nerves of volition.

2ndly. The action of galvanism is determined by the healthy condition of the brain and spinal marrow.

3rdly. The skin must possess a normal sensation, as well as temperature, before the galvanic action can affect the muscular fibre.

4thly. The positive plate or wire should be applied over the region of the origin, and the negative to the region of the termination of the nerve.

5thly. The galvanic influence, when passed along the spine, will be most active in the paralysed limb.

6thly. Galvanism is assisted by the alkalies and mercurial action.

7thly. Galvanism restores diminished temperature, decreased circulation, and lost muscular action, in the following order:—Temperature first; circulation second; and muscular action last.

8thly. Galvanism has no effect in disease that alters the structure of nerves.

9thly. It supersedes manual friction.

10thly. It is assisted by immersion of the affected limb in a warm bath, into which the negative plate or wire is placed. In passing a current from the

head through one half of the body, the foot should be immersed in warm water.

11thly. It is injurious when much pain is caused in the muscles by its application.

12thly. It may be carried to an undue extent, so as to produce congestion of the brain.

The following additional cases are related in support of the above remarks:—

William Borkitt, aged forty-seven years, of middle stature, by trade a shoemaker, applied to me in May, 1838, in consequence of a painful affection of the left arm and hand. The extensor muscles of the forearm were nearly paralysed; the animal heat reduced so much that he could not keep the arm warm; the pulse slower in the affected arm than the other. He stated, that during the last twelve months he felt occasional pains, which gradually increased, in the outer part of the shoulder, extending down the radial side of the arm to the tips of the fore and middle, and half of the ring finger. The pain was generally followed by a cold sensation, succeeded by a burning heat, and a total inability to retain any substance between the finger and thumb. The median nerve, in this case, appeared to be the one principally affected. I ordered him, for the space of fourteen days, to immerse the limb in a mustard bath twice a day, and to

use friction to the arm, with hog's lard; to take magnesiæ sulphatis, ʒij. in a wine-glass of camomile tea, every morning. Still the pain, with loss of power, continued. I then ordered to be used a stimulant embrocation of liq. ammoniæ and linimentum saponis, which brought out an eruption of small boils over the whole limb; yet the pain and inability remained. I then gave him the pilulæ hydrargyri, so as to produce ptyalism, which greatly improved his health, notwithstanding which the inability to use the hand and arm remained the same; but the pain somewhat subsided, and became less frequent and severe. I now began to apply galvanism, by means of a battery of twenty-four cups, containing the segment of a circle of plates of copper and zinc, four inches square, immersed in diluted muriatic acid, which being continued daily, from the shoulder to the hand, for three weeks, the pain entirely subsided, the skin regained its normal temperature, and the hand its power. At this stage of the case I deemed it advisable that my patient should go to agricultural labour before he resumed his occupation as a shoemaker, which he did for the space of two months: by so doing he improved his general strength, and, with the exception of a benumbed feeling at the tip of the middle finger, the use of the hand and arm is now quite restored.

Mrs. Ballard, thirty-six years of age, applied to me May, 22nd, 1837. I found her suffering from a partially staphylomatous appearance of the eyes, an inflamed conjunctiva, and an extreme sensibility on the admission of light; the upper lids in constant action, with immobility of the iris. On the admission of light, it caused pain in the head, over the upper and back part of each parietal bone. The mind much depressed; general debility; the tongue white, with numerous papillæ on its surface; bowels torpid; the evacuations deficient in bile; the urine very irregular as to quantity and quality; the skin dry. On my first inspection of this case, I considered the pain in the head and the mental depression to arise in part from hepatic derangement. I ordered her pil. hydr. gr. ij. and acid. nitrici, gtt. iij. in barley water, three times a day; conjoined with a milk diet, night and morning, and beef tea or mutton broth for dinner. This plan had the desired effect of removing the cerebral symptoms, and correcting the functions of the liver and intestines: nevertheless, the involuntary action of the upper lids continued, and the extreme sensibility on the admission of light, with almost a completely paralytic state of the iris. I now ordered a tepid shower-bath to be used every morning; a more solid diet of animal food without stimulants to be taken; and

walking exercise, gradually increasing the distance, so as not to produce fatigue. I also passed galvanic shocks, from eighteen cups and three inches square plates, through the upper and back part of the head, to the exit of the superior and inferior obitar nerves, and through the temporal bones. At the end of five weeks after using the galvanism, I had the satisfaction to see a steady improvement. The eyelids became regular in their action, the iris obedient to the ingress of light, and the system generally improved, so that she was enabled to resume her duties as a confidential servant in a highly respectable family. Previous to the application of galvanism, there was a great diminution of temperature as well as sensation over the whole skin. This case had been submitted to medical treatment in London, for seven months previous to my attendance; and I feel fully persuaded that, without the aid of galvanism, the other measures would have only afforded partial relief. She has remained well up to the date of this paper.

Mrs. Doust, aged twenty-nine years, applied to me, March 3, 1835. She had been attacked with paralysis of the left side of the head, face, left arm, and leg. She was the mother of six children, was of plethoric habit, and had had three abortions at the sixth month of gestation. With the use of depletory measures and

the mercurial action, her health became much restored, with partial use of the hand and leg.

In June, 1837, while at work as a penciller in a printing manufactory, she had a most painful spasmodic action of the left arm, which was relieved by a repetition of small doses of ant. tart. and sulphas magnesiæ, and leading a more active life. After a time the arm became less useful, so that she could not raise it from her side.

August, 1837, I applied the galvanic influence to the arm, but with little or no benefit, as the brain soon became congested, and it was found futile to continue its use.

May, 1838, she had another attack of paralysis, with menorrhagia, which I treated with venesection and assafœtida, with neutral salts. The health being restored, I determined on again persevering with the galvanic agency, in conjunction with the use of mercury. Consequently I commenced passing shocks of galvanism from the nape and side of the neck to the arm, with a battery of twelve cups, containing plates the segment of a circle, six inches by three, immersed in diluted muriatic acid. This method of passing the shocks was attended with great irregularity as to its effect. I then had the foot put into a hot bath, into which I placed the negative plate. (I should have

observed, I use two plates, three inches square, which are applied to the surface of the skin, and communicate with the wires from the cups.) The shocks passed more freely down the leg, but were not felt in the arm. Removing the positive plate to the spine, opposite the lumbar vertebræ, I kept the negative plate in the foot-bath. By this application the galvanic action became most powerful in the left arm and hand to the tips of the fingers, producing very violent extension of the arm. At the end of fourteen days I suspended the use of the mercury, and gave her one drachm of the carbonate of iron three times a day, continuing the daily application of the galvanism; by this means she recovered the full use of the leg and arm, but not the fingers, although she could manage to tie a knot.

In this case, the cerebral congestion increased according to the increased action of the galvanic agent. It also shews a very singular action of galvanism. I have ventured to attribute this strange effect to the agent passing to the origin of the cervical nerves through the grand sympathetic nerve, as an unusual heat was felt in the stomach and bowels. Certain it is, she only regained the action of the muscles of the arm and hand, as the galvanism was passed through the lower portion of the spine to the foot.

May 9th, 1838.—Mr. B. H. Goldie, a clerk in the ordnance department, sought my advice, in consequence of paralysis affecting the whole of the left side of the body (hemiplegia). He is a man of full stature, fair complexion, temperament melancholic; he also suffered from an unreduced dislocation of the right os femoris on the dorsum of the ilium, so that he was quite helpless. He stated that about fourteen years ago he slipped off the steps of a friend's house, and ruptured the tendo Achillis of the left leg. In consequence of the passive treatment then enjoined, a gradual loss of voluntary power over the muscles of the left arm and leg succeeded, extending upwards to the half of the head, with diminished circulation, and constant sense of coldness, not only in the extremities of the left side, but in the side of the chest and body. The left upper eyelid fell, so as nearly to obliterate vision. His habits of life were sedentary, and very abstemious both in eating and drinking. The bowels were sluggish, indicative of torpor of the liver; urine generally high coloured, and lessened in quantity. The pulse of the right radial artery 86 in the minute; of the left radial artery 74 in the minute. In this case, I, from the onset, had an ulterior view to the application of galvanism, but not until the secretions were corrected. I ordered him to abstain from animal

food, and have recourse to a bread and milk diet, and to take pil. hydr. gr. v.; pil. rhei. c. gr. v., every night; with a draught in the morning, composed of vin. colchici, ʒss; liq. ammoniæ acetatis, ℥ss; sol. magnesiæ sulphatis, ℥j.

May 16th.—I took eight ounces of blood from the arm, which very much relieved the brain; continued the medicine, with the use of the warm bath, at 105° Fahr., twice a week, until the first of July, occasionally suspending the aperients, according to the action of the bowels, so as not to produce mucous evacuations. I now recommended him to take a wine glass of Griffith's mixture twice a day, and use the flesh-brush to his limbs. The mental depression subsided, and the secretions became healthy, with a more equal state of the temperature and circulation.

July 16th.—I commenced the daily application of galvanism, (with a battery of forty-eight pairs of plates, three inches square, arranged like the *couronne de tasses* of the French, the plates being circular,) passing the shocks from the head, neck, and spine, down to the foot, which was immersed in a hot bath, into which I put the negative plate. During the first week my patient experienced only a gentle warmth, which greatly increased up to the tenth day. The pulse then rose. On the thirteenth day, the muscles

began to act rapidly and very powerfully, so that on the twenty-first day he lifted the leg and foot out of the bath without aid, and grasped very firmly with the left hand. The galvanism was continued, with increasing power, until it could hardly be borne by the patient; only lessened in effect when he had slight cold or febrile action, from change of weather, &c. During this process, in consequence of congestion of the brain, I found it necessary a second time to bleed him to the amount of eight ounces.

Aug. 16th.—I discontinued the use of the galvanism, he now being able to walk with a stick and crutch.

Oct. 23rd.—He resumed his duties in excellent health, but still with some defect in the muscular power of the left arm and leg. I ought also to observe, that the left leg and foot were œdematous; also the tendo Achillis was much thickened where it had been ruptured: this also was reduced.

INJURIOUS EFFECTS OF THE INDISCRIMINATE EMPLOYMENT OF ERGOT OF RYE.

THE following case, shewing the ill effects of ergot of rye, has recently come under my notice. Perhaps it is of sufficient importance to be made public, as I am informed that the exhibition of the secale cornutum is very frequent with those practitioners who contract for parochial attendance.

In the year 1835, Mrs. ——, aged thirty-five years, was taken in labour with her sixth child. A medical gentleman, who attended the poor of the parish, was sent for, but finding the case proceeding slowly, blamed them for sending for him so early. The pains were natural and regular. Notwithstanding this, he gave her the ergot of rye, which was followed by the most excruciating pains, one of them lasting for full two hours. Through the action of the drug, the head was expelled, and remained in that position an hour or thereabouts. When the body was born, the fœtus was dead; nor did the pains cease on the expulsion of the child: they continued, more or less, for four days. In consequence of such treatment, Mrs. —— made

her case known to a respectable inhabitant, who promised to assist her in obtaining my attendance on her then expected confinement.

Sept. 25th, 1836, at four o'clock A.M., I was sent for, and found the liquor amnii had escaped; the head presented; the os uteri was not fully dilated; the pains regular, extending round her: these continued until seven o'clock. Thinking they might last three or four hours longer, I returned home. At eight o'clock I was again summoned; the pains had changed; the head had descended into the first outlet of the pelvis. I waited till half-past ten o'clock, the pains becoming very severe and powerful; nevertheless, the head remained fixed, or in a state of arrest. The os uteri was now fully dilated, and I determined on effecting delivery with the forceps, which was accomplished, but not without great compression of the head and much traction. As in the former instance, so in the latter, the fœtus was of an unusual size, certainly as large, if not larger, than any I had seen after having practised midwifery nearly twenty years. On inquiring of the mother whether she had suffered more this time than during her last labour, she stated that her present sufferings had not been half so severe as when she had taken the powder, or, rather, infusion. The mother and child are doing well.

The ergot of rye, though known as a therapeutic remedy in France, as early as the beginning of the last century, has only of late years been brought into general use in this country. Nearly all the writers on its effects admit the great irregularity of its action. Dr. Blundell, in his Lecture on Lingering Labour, makes the following remark, which is worth attending to: "The secale cornutum is likely enough to destroy the fœtus if you use it—not in the lingering cases which we are now considering, but when the birth is delayed in consequence of increased resistance, rigidity, narrowing, or an unfavourable position of the head. In cases like these, if the secale cornutum be exhibited, and have a very lively effect, it may force the child down among the bones of the pelvis, where it may die by compression; not to mention that, under the circumstances stated, there must be no small risk of rupturing the uterus."

I have seen the uterus impaired, as to its future contractile power, after the use of large doses of ergot of rye, and have frequently had occasion, during the last two years, to apply the forceps to assist the parturient effort of those persons in whom the practitioner had previously hastened the labour with the above drug. On the other hand, if the cases be properly selected, it forms a most useful auxiliary in effecting the expulsion

of the fœtus. The æthereal tincture of the ergot of rye I have found very valuable in suppressing uterine hæmorrhage, and I am in the habit of giving one drachm, in a wine glass of warm water, to mitigate the after-pains; it relieves the patient better than opium, and without producing any ill effect on the sensorium. If too much discharge come on after delivery, I increase the dose to two drachms, and repeat it according to necessity. When there is impaction of the head of the child, whether owing to insufficiency of the uterine power, or large size of the head, I am of opinion that it is much to the interest of the patient, in reference to her future well-doing, to apply the forceps at the proper time, (i. e. after being satisfied that the expulsive powers of the uterus are ineffectual;) and if they be adroitly used, the practice is perfectly safe, and will be attended with the most satisfactory results; for wherever there is defective tonicity, it is an evidence of a flaccid state of the muscular structure of the uterus, which renders it incapable of continued exertion, and terminates in an irritable state of that organ; the heart likewise becomes irritable; the pulse soft and unsteady, and easily accelerated. It is quite obvious that the patient, in such a condition, must be prone to fever and irritation, for the system, in a state of atony, is liable to the action of many exciting causes of disease.

INFLUENCE OF THE VACCINE INOCULATION OVER SMALL-POX.

During the last seven years (1835), I have been in the habit of recommending vaccination *not* to be performed till after the first nine months, believing that, after that period, the effects of vaccination are greater than previously.

The following case shews the power which is exercised over small-pox by the vaccine matter:—

Four children, of the name of Reynolds, died of confluent small-pox; another of the children, who did not shew any of the premonitory symptoms, was taken, Jan. 15th, 1832, during the time the others lay dead in the house, to a child, and from it vaccinated in eight places. On the third day, the variolous eruption made its appearance, with the usual febrile symptoms. On the fourth day, the small-pox began to die off, the cow-pox going through its natural phases. On the sixth day, the variolous affection again appeared and ran its proper course, there not being more than forty pustules.

ON PREMATURE VACCINATION.

HAVING asserted that no child ought to be vaccinated during the period of lactation, by which I mean during the first nine months, in confirmation of this statement the following facts may perhaps serve as an example. Mr. Al——s had three daughters vaccinated, the eldest and youngest before the sixth week; the second not until she was a year and half old. About three years ago, the eldest had the small-pox very severely, and was nursed by the second sister, who escaped it. About three weeks back (Jan. 1836), I re-vaccinated the second and youngest. The cow-pox in the youngest ran its natural course; the patient laboured under considerable febrile action from the eighth to the twelfth day. In the second sister, it appeared to rise regularly till the third day, and then died away. The eldest is now about thirty, and the youngest about twenty years old.

I lately saw four children who had been inoculated for the small-pox: only one of them had been vaccinated. She had between thirty and forty pustules; the other three were very full. On inquiry, I learned that the child had been vaccinated before it was two months old.

VACCINATION IN THE EARLY MONTHS OF INFANCY.*

Sir,—In your Journal for April 2nd, 1836, Mr. Aikin has written some observations on vaccination, wherein he considers the opinion I advanced, and supported by examples, on the influence of vaccine matter during the period of lactation, as fraught with danger. He says, "I hardly know any opinion that would prove a greater obstacle to the diffusion of the blessings of vaccination, than that of its inexpediency during the first nine months of infant life." Probably I erred in specifying the period of nine months, but from the mass of *facts* which have been presented to me on the subject, I still think it well to adhere to the principle as a general rule. From this it is not to be inferred that we are never to vaccinate a child under nine months old; circumstances such as Mr. Aikin has mentioned, as well as others, may frequently arise to induce a medical man to make exceptions to this rule.

* The following letter was addressed to the Editor of the "Medical Gazette," April 6th, 1836.

Since I first published the opinion as an observation or recommendation in the "Medical Gazette" for June 13th, 1835, I see that a most able account, delivered by Dr. Murray, at the South African Literary Institution, has been inserted in your Journal for August 1st, 1835, in which my ideas are fully borne out; it is a statement worthy the attention of all who feel, with me, how important it is to establish the great blessing of vaccination upon a right foundation.

Knowing Mr. Aikin's great experience on the subject, for self-justification I shall beg to make a few short quotations from Dr. Murray's paper. He says, "I have become impressed with the idea that vaccination, in very early infancy, is probably a principal cause of its failure, from reflecting upon the known insusceptibility of the infantile constitution to contagion in general, and from having had occasion to observe some very marked instances of its insusceptibility to scarlatina, during the prevalence of that disease here, in 1830, at which period, although children were chiefly the subjects of its attack, young infants generally enjoyed the privilege of exemption from it, as if their system were insusceptible of the morbific effect of its contagion."

Dr. Underwood, who wrote specially on the

diseases of children, states, that although the small-pox is a complaint so incident to early life, that comparatively few children living to the age of eight or ten years are found to escape it, yet it is not so readily communicated, in the state of early infancy, as hath been generally imagined, unless by immediate infection—i. e., by inoculation. "Every one," he observes, "knows how very few infants he has heard of having received the small-pox naturally, though fewer of those are inoculated than of children above a year old; and this exemption from the natural small-pox does not seem to arise from their not being exposed to the ordinary means of contagion, especially amongst the lower and middling ranks of people, who form the bulk of mankind: the poor furnish frequent instances of the truth of this observation. I have attended where children were born in an air saturated, as it were, with the miasma of the disease, and even lying continually in a cradle in which another child had died a few days before, and who have nevertheless escaped the disease, and sometimes when they have slept together in the same bed with one loaded with it."

Relative to the tabular account of deaths from small-pox, for the years 1768 to 1774, as collected from the register of the Collegiate Church at Manchester, and recorded in the fifth volume of the

" Medical Observations and Inquiries," Dr. Perceval observes, that from the said document it may be concluded, that small-pox rarely occurs in children in the early part of infancy, experience shewing that they are not much predisposed to receive it; and this conclusion is confirmed by Mr. Aikin, in his account of the variolous epidemic which raged with great violence in the town of Warrington, in 1773, as well as by the experience of Dr. Munro, who informs us, in his work on inoculation, " that of twelve infants whom he inoculated within a fortnight of their birth, not one had the variolous eruption."

Mr. T. K. Deane, the secretary of the Cape Vaccine Institution, in answer to some inquiries on the subject, says, " With regard to persons who have been vaccinated here in infancy, and afterwards exposed to variolous contagion, a number are reported to have taken small-pox when they have gone to Europe for education, &c., but to have had it in a mild degree. Of these I personally know eight, and I have heard of several others who became attacked in a similar way on going to India; but of those who were above four years of age when vaccinated, in 1803, when the cow-pox virus was first introduced into this colony, and who have subsequently gone to Europe, not one has ever become affected with the small-pox, as far as I

know, and the number that I have ascertained to have been put to this proof is sixty-one, and one of them is a physician, who had just returned from Europe when small-pox broke out here, in 1812, and who was placed in charge of one of the small-pox hospitals then established in Cape Town." Dr. Murray states, "that when small-pox made its appearance in 1812, fifty-four government slaves were re-vaccinated here, as a precautionary measure, although they had all been subjected to the operation the first time the virus was introduced, in 1803, when they already had attained the age of puberty; and in no one instance did the second vaccination take effect, nor did any of them become affected with small-pox, although they were, on more than one occasion, exposed to its contagion." Dr. Murray thus concludes, "according to my present opinion upon the subject, I would recommend vaccination to be deferred, in infants, till the fifth or sixth month."

I remain,

Yours most respectfully,

JOHN GRANTHAM.

FIBRINOUS DIARRHŒA; OR, DIARRHŒA TUBULARIS OF DR. GOOD.

This disease is of rare occurrence, and of a most unmanageable kind, assuming, in the generality of cases, a chronic character. Dr. Golding Bird, in the Guy's Hospital Reports, says, "It is probable that the follicles are the principal seat of the disease; for we know that they sometimes secrete a dense mucus, differing little in its physical qualities from coagulated albumen, or even fibrin; and the researches of modern chemistry go far towards shewing, not only the close connexion, if not identity, between fibrin and albumen, but also that the formation of mucus requires little more than the addition of saline matter to albumen in a state of minute subdivision; and conversely, that the withholding of the saline particles may cause a secretion of albumen instead of mucus."

In the cases that have come under my notice, the discharges from the intestines have assumed, in the first stages of the complaint, a mucous appearance;

secondly, a mixed muco-fibrinous character; and lastly, the evacuations have contained true fibrin. The evacuations of fibrin have been preceded by long-continued pain in the abdomen, and great irregularity in the temperature of the skin; the individual being highly sensitive to a damp atmosphere, which caused spasmodic pains in the abdomen. When the mucous membrane of the fauces and posterior nares is implicated in the disease, the patient suffers much from violent pain in the head, referrible to the region of the parietal bones, with extreme irritability of mind. There is a great tendency to acidity in the stomach, which is increased under the use of a liquid diet. The abdominal pains are always of a spasmodic character, and at times very acute, extending to the neck of the bladder, and down the inner part of the thigh. The tongue assumes a white appearance, with indentations round the edges; sometimes ulceration of a phagedenic kind forms over the tonsil glands. The pulse is seldom altered, generally maintaining a steady, healthy feel; the skin is often studded with numerous papulæ, especially over the chest, neck, and face; the urine denotes an anæmic condition of the kidneys. Occasionally such patients pass urine with evident traces of albumen, seldom containing a normal quantity of the phosphates. On an increase

of fever or mental excitement, a larger quantity than natural of the lithate of ammonia is found; frequently, the mucous membrane of the bladder is found thickened in these cases. The fæces, which are very seldom incorporated with the fibrin, are often very healthy in appearance, clearly shewing a natural action of the glandular system. Although it is said by most authors that this disease is by no means fatal, yet I think I have seen it degenerate into atrophy of the intestines.

Causes.—In every case that I have witnessed, I have invariably found the disease produced by the exhibition of mercury conjoined with the too frequent use of aperient medicine; mercury disorganizes the blood by separating the fibrinous particles. (M. Bauer observes that fibrin exists in the form of very minute white globules in the blood in a state of health: see "Philosophical Transactions," 1820, p. 1.) Although mercury does remove depositions of coagulable lymph or fibrin, I am fully confident it also causes a tendency to deposition of lymph. Suppose there be venous congestion of an organ during the action of mercury, so as to interfere with the normal law of the capillaries, what will be the result? an interstitial deposition. I have not presupposed such a statement, the facts have been presented to me

in the usual mode of investigation, and the more I observe the complaint, the more I am convinced of the above truth. Such patients always experience an acceleration of symptoms from the use of mercury, particularly calomel, even in small doses. The disease is also found in patients who are very readily salivated, so that it is just right to admit that there may be a peculiarity of constitution when mercury produces such untoward effects. I feel that, in making the above observations, I may subject myself to some controversy; but let me entreat any one who may doubt the statement, to investigate the disease for himself, before he comes to any conclusion. It is a fact, known to those whose practice has enabled them to examine the blood of patients under a state of ptyalism from the effects of mercury, that the blood of such patients is buffy, or, in other words, the fibrin of the blood is found separated from the rest of the crassamentum.

Treatment.—It is necessary to pay great attention to the locality in which the patient resides, as the situation ought to be dry, and free from malaria. The clothing must be warm; flannel next the skin, and the feet protected with cork soles in the shoes; and what I very much commend is friction of the body or trunk with oil or lard every night, and tepid

ablution with soap and water every morning: the muscular system should be regularly exercised, without fatigue. The diet should be spare and solid, consisting of bread and meat, in the form of a thin sandwich, with salt and aromatics. All stimulants are indirectly injurious: if the stomach be not irritable, or rather if there be no redundancy of acidity, milk may be given, as a diluent, with the greatest advantage. As a general rule, aperients are bad, leaving the patient very prostrate, but when indicated, (that is, when large collections of fibrin lodging in the intestinal canal, act as a source of pain,) a tea-spoonful of castor-oil is the best purgative. Ammonia and soda are needful according to the acidity of the stomach, or rather when the urine contains a larger quantity than natural of the lithate of ammonia. Carbonate of ammonia should also be given as an antiseptic, when there is torpor of the sensorium, indicative of a low character of fever. The mineral acids are to be preferred as tonics when required. An enema of warm water, gradually reduced to 50° Fah., is to be used every morning; and, according to the symptoms, narcotics are to be added. Should the effects continue, despite of these means, the nitrate of silver ought to be used, by way of injection per rectum, one-sixth part of a grain to be administered

night and morning. I have never found any benefit from the use of turpentine, copaiba, benzoin, tar-water, or arsenic, nor of any counter-irritant. These cases may be assisted by an occasional hot salt-water bath. In conclusion, the treatment should be of a negative character, by which I mean, avoiding everything that may interfere with the natural law of the part affected; or, in other words, let the organism of the intestines effect its own restoration. It is better to keep that principle in view during the treatment; yet, on the other hand, all irritants must be removed, and acute pain must be subdued. In the early stages of the complaint, when the evacuations are of a mucous or muco-fibrinous character, the hydriodate of potash, with morphine, may be given with advantage, the former in ten-grain doses night and morning, with half a grain of the latter at bed-time.

There is another means which I would advocate in the treatment of this disease, and that is the use of the oleum jecoris aselli. In a case of diarrhœa fibrinosa, that has given me much trouble, and very little success from the use of various therapeutic measures, I gave the oil, when there were evident symptoms of atrophy of the mucous structures of the body, with loss of power, and frequent spasmodic pains in the intestines. The patient under its admi-

nistration improved in strength and increased in flesh, and the spasmodic pains were very much lessened; still, however, the fibrinous discharge continued.

Dr. Nebel, of Heidelberg, speaks in the highest terms of its advantages in tabes mesenterica. Dr. Menche, of Pyrmont, communicated to Dr. Hughes Bennett, the author of a very comprehensive and candid work on the oleum jecoris aselli, the following remarks on a case of atrophia mesenterica. The son of a gentleman fell a victim to atrophia mesenterica, and, said he, "I shall not readily forget the regrets he expressed at not having been previously acquainted with a medicine which he considered to be almost a certain remedy for the disease;" yet it is but just to add, that in those cases which have been reported, the oleum jecoris aselli was given in conjunction with the extract of cinchona, and the external use of the hydriodate of potash. I am certain that animal oil is indispensably necessary in diarrhœa fibrinosa; therefore I the more willingly believe what has been said of the sanatory effects of cod-liver oil in other diseases where there is a strumous diathesis. I do not say that struma produces diarrhœa fibrinosa, but I think that the disease is more likely to be found in constitutions that denote the presence of scrofula than in others. There is another analogy, which has in-

duced me to recommend this medicine in the above disease, and that is, its well-authenticated success in diseases of the skin which put on a scrofulous character. We well know the similarity of structure of the one organ with the other, the intestines being a continuation of the common integument. In diseases of the skin, it is only beneficial as an external remedy, as, for example, in chronic eczema, herpes, and intertrigo. Brifeld and Guerard state that they have cured many obstinate cases of tinea favosa with this oil.

Subsequently to the publication of this paper,* I have received a letter from my friend, Mr. Erasmus Wilson, who expresses himself, with regard to my views and the nature of this disease, in the following terms:—

"There are two points in your description of fibrinous diarrhœa that chiefly strike my attention, and upon which I will now give you the results of my experience. The *first* relates to the following passage:—'In every case that I have witnessed, I have invariably found the disease produced by the exhibition of mercury, conjoined with the too frequent

* Dec. 2, 1843.

use of aperient medicine.' The *second* has reference to the opinion expressed by Dr. Golding Bird, that the probable seat of the disease is the mucous follicles of the intestine.

"A case, which I have strongly impressed on my recollection, is opposed to your mode of viewing the disease, but forms a link in the chain that leads to truth. A young woman, about ten years since, was teased with occasional diarrhœa, but was otherwise in health, and went about her customary avocations. Observing some whitish flakes adherent to her fæces, she separated some, and conceiving them to be worms, carried them to a worm doctor in Long Acre, who gave her medicine to 'bring the worms away.' Before taking the medicine she applied to me, and shewed me the white membraniform flakes. I recommended diluents, and simple hygienic measures. The diarrhœa continued to be occasionally inconvenient for several months, the fæces being more or less coated with fibrinous pseudo-membranes; but at the end of that period the disorder disappeared by degrees, and she remains well. She had never taken mercury, nor was she in the habit of taking aperient medicines.

"I have lately seen another case that appears to me to bear upon the pathology of this disease. A gentleman, in good health, of a regular habit of

bowels, had a sudden attack of hæmorrhoids. The hæmorrhoidal swelling was very painful and highly inflamed, and the inflammation extended to the rectum. After voiding his fæces one morning, he perceived a white fibrinous pseudo-membrane, several inches in length, and nearly an inch in breadth, lying upon the mass. I examined this membrane; it was identical in appearance with the fibrine of the blood; and I came to the conclusion that the inflammation which produced it was analogous to the tracheal and bronchitic inflammation that produces the false membrane of croup; that, in fact, liquor sanguinis had been effused upon the surface of the mucous membrane, and its fibrin, coagulating in that situation, remained in the form of a membrane. Had the liquor sanguinis been effused into the tissue, instead of upon the mucous membrane, the consequence would have been swelling and thickening.

"I do not agree with Dr. Golding Bird in thinking the principal seat of the inflammation in this disease to be the mucous follicles, nor does the false membrane appear to me to be simply an altered mucous secretion. The mucous follicles may, and very probably do, constantly participate in the inflammation of the mucous membrane; there is nothing antiphysiological, moreover, in supposing that they may be inflamed separately

from the mucous membrane. But the character and appearance of the membranes that I have examined, their breadth and continuity, have led me to believe that they are a product of the superficial mucous surface. Animal chemistry can avail us little in determining the nature of a deposit of this kind. Protein, albumen, gelatine, fibrin, mucus—all are composed of the same elementary constituents, varying so slightly in proportion, that it is clear that they are all modifications of the same staminal principle. In croup, we do not hesitate to ascribe the production of the false membrane to the superficial mucous membrane; indeed, we have seeming proof that this is the case in the smaller relative proportion of the inflected membrane: I am therefore desirous of claiming as much for the pulmonary mucous membrane in another place—namely, in the alimentary canal.

"Against my hypothesis of the analogy between croup and fibrinous diarrhœa, you might be inclined to urge the acute inflammation of the former, and the chronic character of the latter. But the latter is chronic only in duration; its seat is limited and dispersed, and the patches which produce the lymph are each, as I imagine, as acutely inflamed as the pulmonary mucous membrane in croup."

MALFORMATION OF THE GENITALS.

THE present case of malformation of the genitals has come under my observation; it is similar to the one related by Mr. Earle, (in the Lancet, vol. ii., 1832 and 1833, p. 797;) and what renders these cases more singular than other instances of lusus naturæ, is the semblance of health they present. This child is in every way, humanly speaking, calculated to have an average duration of life. On examination of the case, with my friend, Mr. D. Culhane, of Dartford, June 30th, 1841, the following appearances presented themselves. The child was in excellent health, with a good cranial development; chest well formed; the arms and legs of full size; the scrotum and testes natural. Immediately above the scrotum there was a fold of integument attached to what might be termed a penis; there was the preputium glandulæ, with the inferior surface placed superior, and grooved along the urethral part

of the penis; between the umbilicus, pubes, and recti muscles, intervened the posterior part of the bladder, with the termination of the ureters and vasa deferentia, the internal surface of the bladder being exposed to the air. On again examining the case, July 8th, I was surprised to see two streams of urine passing out through the ureters, as if they had been expelled by muscular power. Without doubt the pelves of the kidneys were filled, and by the act of undressing the child, pressure was made by the intestines over the anterior part of the kidneys, so as to expel the water in the form of a stream. This is an interesting illustration of the presence of organic muscular fibre, which has been shewn to exist in all excretory ducts of glands. The correct definition of the erectile tissue is still involved in mystery. Professor Müller thought he had demonstrated a set of helicine vessels, but was successfully refuted by M. Valentin; and Mr. Erasmus Wilson, in his article, "Penis," in the Cyclopædia of Anatomy and Physiology, points out the cause of the error committed by Müller. Valentin has subsequently shewn the dependence of the peristaltic action of the ureters on the influence of the sympathetic nerve, by irritating any of the abdominal ganglia. In Mr. Earle's case, which was a child seven years of age, that gentleman contrived an apparatus to prevent the

constant dribbling of water over the skin, by having a silver bowl attached to an elastic tube communicating with the bladder, and secured around the thigh. It would be desirable to know whether the plan pursued answered the purpose, as it is well known to every practical man how great the difficulty is of affording even a temporary means of relief in any case where there is deficiency of tone in the bladder.

Dr. Vernon, of Bury, in Lancashire, has reported a similar case in the Edinburgh Medical and Surgical Journal, vol. xxvii., 1827, p. 81.

THE END.

T. C. Savill, Printer, 107, St. Martin's Lane.